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ABSTRACT

The sixth annual study of the economic performance of 15,055 graduates in 1979 of 14 vocational programs in Ohio used federal income tax records. Twelve of the programs with 13,109 graduates were secondary vocational programs. A total of 1,946 students graduated from 2 associate programs. The income of completers of vocational programs was compared to income of equivalent groups in the general population. The study also investigated the geographic mobility of vocational graduates since 1979. Results indicated predominantly higher incomes of vocational graduates than others in the general population. The result varied by vocational program, but the ratios were higher than 1 for the 1979 graduates in all programs for all years of the study (1983-1988). In all 12 secondary programs, the ratios were higher in 1988 than in 1983. For the 1979 graduates of the two associate programs, the ratios in 1988 were higher than the 1987, 1986, 1985, 1984, and 1983 ratios. Findings showed a continuing margin between incomes of vocational graduates and the equivalent group in the general population. (An executive summary and 64 tables and diagrams are included.) (YLB)

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1979 Vocational Education Graduates

in 1988

A Longitudinal Study Based on Federal Income Tax Data

by

I. A. Ghazalah

Professor of Economics
Ohio University

U.S. DEPARTMENT OF EDUCATION
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1979 Vocational Education Graduates

in 1988

A Longitudinal Study Based on Federal Income Tax Data

by

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Executive Summary

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1993

The economic performance of graduates of vocational programs is a primary factor in the evaluation of vocational education. This study evaluates the performance of students who completed state-funded vocational job-training programs in Ohio.

The study uses an original source of information – federal income tax records. The data were provided in batch form by the Internal Revenue Service from its Information Returns Master File in full compliance with the strict requirements regarding disclosure of personal information.

This study examines the performance over time of 15,055 graduates in 1979 of fourteen vocational programs. Twelve of the programs with 13,109 graduates were at the secondary level, and two with 1,946 graduates at the associate (second-year college) level. This is the sixth year of this longitudinal study where the performance of the 1979 graduates in 1988 was analyzed and compared to that measured in 1987, 1986, 1985, 1984 and 1983.

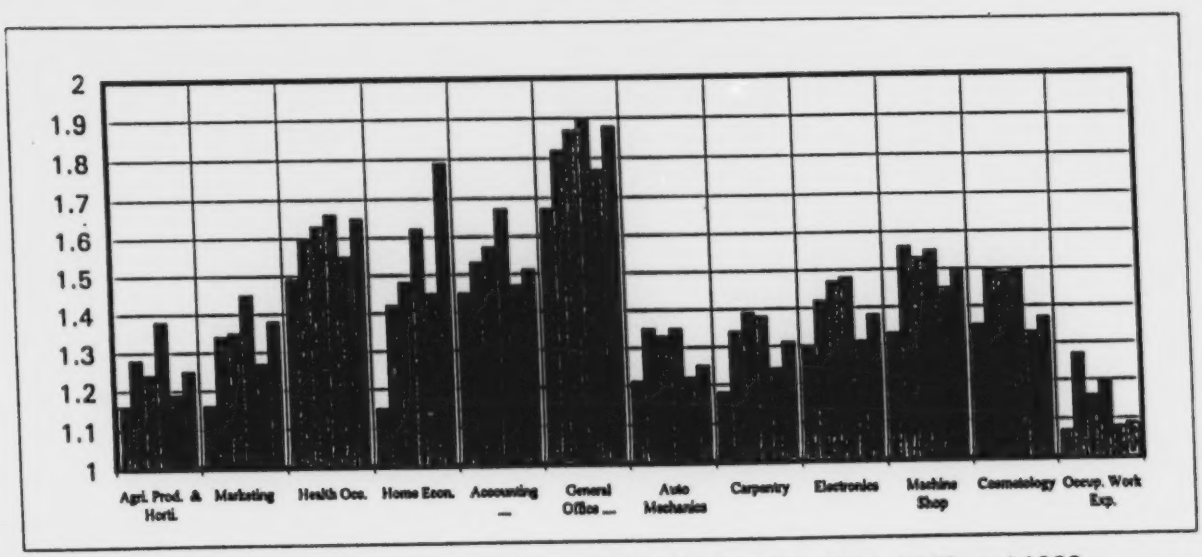
The incomes of vocational graduates were compared to those in the general population at the same age, educational achievement and geographical location. Data on the equivalent groups in the general population were based on Bureau of the Census, Current Population Survey, Technical Documentation Tape prepared by Data User Services Division, Data Access and Use Staff for the Bureau of Labor Statistics, and East North Central Population and Per Capita Income Estimates for Counties and Incorporated Places.

The following table and the corresponding graphs show the ratio of the average income of vocational graduates to the average income of the equivalent group for the 1979 graduates during 1988, 1987, 1986, 1985, 1984 and 1983.

Ratios of Mean Income of 1979 Vocational Graduates to Mean Income of Equivalent Group in the General Population (1983-1988)

	1983	1984	1985	1986	1987	1988
Secondary Programs						
Agricultural Production and Horticulture	1.16	1.28	1.24	1.38	1.19	1.25
Marketing	1.16	1.34	1.35	1.45	1.27	1.38
Health Occupations Education	1.49	1.60	1.63	1.66	1.55	1.65
Home Economics Education	1.15	1.42	1.48	1.62	1.45	1.79
Accounting, Computing and Business Data Processing	1.45	1.53	1.57	1.67	1.47	1.51
General Office Clerical, Stenographic, Secretarial and Related Occupations	1.67	1.82	1.87	1.90	1.77	1.88
Auto Mechanics	1.21	1.35	1.33	1.35	1.22	1.25
Carpentry	1.18	1.34	1.39	1.38	1.24	1.31
Electronics	1.30	1.42	1.47	1.48	1.31	1.38
Machine Shop	1.33	1.56	1.53	1.55	1.45	1.50
Cosmetology	1.35	1.50	1.49	1.50	1.33	1.37
Occupational Work Experience	1.07	1.27	1.16	1.20	1.08	1.09
Associate Programs						
Health Occupations Ed.	1.68	1.53	1.64	1.73	1.73	1.80
Technical Education	1.16	1.12	1.15	1.23	1.33	1.37

Ratios of Mean Secondary Vocational Graduate Income to Mean General Income 1983-1988



Bars for each Vocational Program show ratios for 1983, 1984, 1985, 1986, 1987, and 1988.

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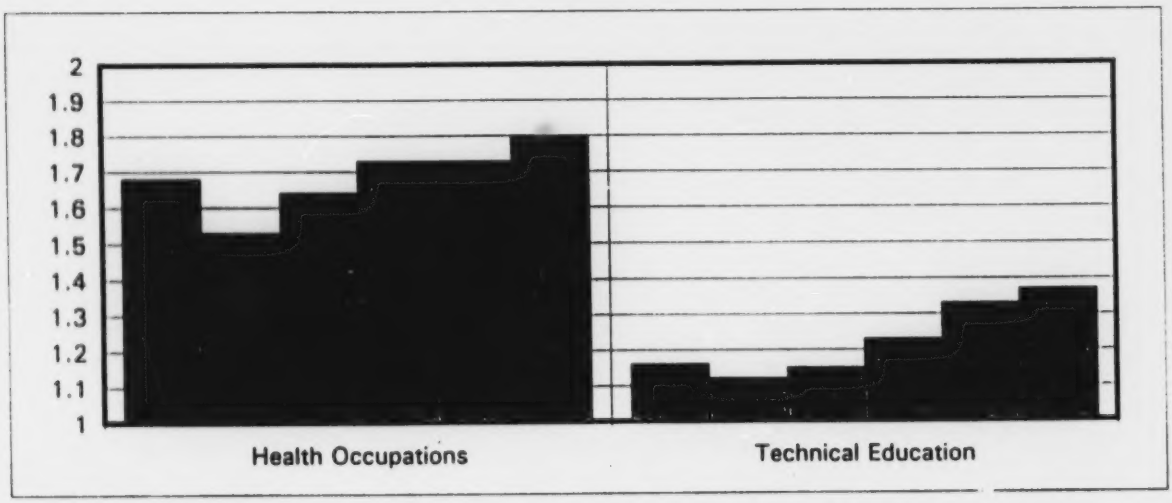
Ratios of Mean Associate Vocational Graduate Income to Mean General Income 1983-1988



Bars for each Vocational Program show ratios for 1983, 1984, 1985, 1986, 1987, and 1988.

The results of the study indicate predominantly higher incomes of vocational graduates than others in the general population who are of the same age and years of schooling. The result varies by vocational program, but the ratios are higher than 1 for the 1979 graduates in all programs for all years of the study 1983, 1984, 1985, 1986, 1987 and 1988.

In all of the twelve secondary programs, the ratios were higher in 1988 than in 1983. For the 1979 graduates of the two associate programs studied, the ratios in 1988 were higher than the 1987, 1986, 1985, 1984, and 1983 ratios.

The study of six successive years of the 1979 graduates has shown a continuing margin between incomes of vocational graduates and the equivalent group in the general population. As this longitudinal study follows up the same group in successive years, a reconsideration of conventional assumptions about the duration of vocational education benefits may be in order.

1979 Vocational Education Graduates

in 1988

A Longitudinal Study Based on Federal Income Tax Data

by

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Professor of Economics
Ohio University

Ohio University
Athens, Ohio 45701
1993

The research project reported herein was performed pursuant to agreement with the Ohio Department of Education's Division of Vocational and Career Education. Contractors undertaking such projects under government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. This research does not necessarily represent official positions of the Ohio Department of Education.

Ted Sanders
Superintendent of Public Instruction
State of Ohio

It is the policy of the Ohio Department of Education, Division of Vocational and Career Education, that educational activities, employment, programs, and services are offered without regard to race, color, national origin, sex, religion, handicap, or age.

PREFACE

The purpose of this study is to evaluate vocational education by examining the economic performance of vocational graduates. In its measurement of this performance, the study uses an original source of information – federal income tax records. The Internal Revenue Service provided the data in batch form in full compliance with the strict requirements for protection of personal information.

I am deeply indebted to many individuals and organizations for their assistance and cooperation in the design and implementation of this study. At the Internal Revenue Service, Dr. Fritz Scheuren, Director, Statistics of Income Division lent his gracious support and encouragement to the research effort. Mr. Peter Sailer provided encouragement, valuable coordination and advice. Ms. Dodie Riley was a source of insightful advice, unfailing support, effectiveness and genuine interest in the project. Ms. Cathy Katz and Mr. Ray Salen organized and processed the data with ability and dedication.

Dr. Darrell L. Parks, Director, Vocational and Career Education, Ohio Department of Education gave his persistent and keen support to the research project. Dr. G. James Pinchak, Associate Director, was a valuable source of encouragement, judicious coordination and advice at different stages of the research. My sincere thanks to Mr. Larry J. Daniels, Mr. Mark J. Schaff, and Mr. Robert D. Sommers for their encouragement and advice.

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Athens, Ohio

I. A. Ghazalah

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CHAPTER I

INTRODUCTION

CHAPTER I

INTRODUCTION

Vocational education, as all forms of education, has a multi-dimensional effect on the welfare of individuals and society. Determination of the economic performance of graduates of vocational programs is essential to the process of decision making over the allocation of a given set of scarce resources among numerous competing uses.

Studies of the economic performance of vocational education graduates generally rely on earnings and related data gathered through personal surveys. Such follow-up studies have a number of limitations:

1. small percentage of returns in the form of completed questionnaires,
2. doubt about the randomness of returns, i.e. that they represent a random sample of the surveyed population,
3. doubt about the accuracy of information provided, partly because the individuals surveyed may not have the information readily available in the form sought by investigators. Particularly in the case of income earned over a full year (let alone various categories of income), the data obtained could suffer from significant inaccuracies.

In its measurement of the economic performance of graduates of vocational programs, this study uses an original source of information – federal income tax records. The federal income tax source avoids a number of limitations associated with follow-up studies utilizing questionnaires. The tax data records are standardized by type of income and by period (tax year), and do not rely on the memory nor the selectivity of individual responses to questionnaires. The data were provided in batch form by the Internal Revenue Service from its Information Returns Master File in full compliance with the strict requirements regarding disclosure of personal information.

Methodology

This the sixth annual study of the economic performance of 15,055 graduates in 1979 of fourteen vocational programs in Ohio. Twelve of the programs with 13,109 graduates were Secondary Vocational programs. A total of 1,946 graduated from two Associate programs.

Each of the vocational graduates was identified by social security number and the code of the vocational program completed. Furthermore, each of the graduates was identified by the school attended. The school location was then used to group trainees by geographical region. The State of Ohio was divided into five regions: Central, Northeast, Northwest, Southwest, and Balance of Ohio. The first four regions contain only metropolitan statistical areas. The Central Region included the Columbus Metropolitan Statistical Area (MSA); the Northeast Region: the Akron Primary Metropolitan Statistical Area (PMSA), the Canton MSA, the Cleveland PMSA, the Lorain-Elyria PMSA, Jefferson County in the Steubenville-Weirton MSA, and the Youngstown-Warren MSA. The Northwest Region included the Lima MSA and Toledo MSA, while the Southwest Region was comprised of Clermont, Hamilton and Warren counties in the Cincinnati PMSA, and the Dayton-Springfield MSA. The region "Balance of Ohio" included Mansfield MSA, Washington county in the Parkersburg-Marietta MSA, as well as all non-MSA counties in the State of Ohio. Table I-A lists these regions by component counties. Diagram I-B shows the five Ohio regions on a state map.

Under a negotiated agreement with the Internal Revenue Service, the Statistics of Income Division of IRS was provided on a magnetic tape with a list of social security numbers in sequence of the vocational education graduates coded by vocational program attended. In addition, the Internal Revenue Service was furnished on hard copy with a list of all zip codes included in each of the five Ohio geographic regions. The list was developed using the following source materials:

1. Bureau of the Budget, Office of Management and Budget, Standard Metropolitan Statistical Areas: Titles and Definitions, 1983, 1984, 1985, 1986, 1987 and 1988.
2. National Technical Information Service, U.S. Department of Commerce, Five-Digit Zip Code Area Data (from 1983, 1984, 1985, 1986, 1987 and 1988 returns), Area four, Codes 43000 through 45899,
3. U.S. Postal Service, Map: National Service Area 4 (including Ohio) showing 3-Digit Zip Code Boundaries.

The Internal Revenue Service utilized its Information Returns Master File to prepare data on the vocational education graduates. A completed table was provided by IRS for each vocational program, in each of the five Ohio regions as well as in a sixth (outside Ohio) region.

TABLE I-A

LIST OF STATE GEOGRAPHIC REGIONS

The State of Ohio was divided into five geographic regions. Four of the regions (Central, Northeast, Northwest, and Southwest) contain only metropolitan statistical areas. The fifth region, Balance of Ohio, includes the Mansfield MSA and Washington County of the Parkersburg-Marietta MSA, as well as all non-MSA counties in the State of Ohio.

The components of each of the regions are listed below:

1. CENTRAL OHIO
Columbus MSA (Delaware, Fairfield, Franklin, Licking, Madison, Pickaway, and Union counties)

2. NORTHEAST OHIO
Akron PMSA (Portage and Summit counties)
Canton MSA (Carroll and Stark counties)
Cleveland PMSA (Cuyahoga, Geauga, Lake, and Medina counties)
Lorain-Elyria PMSA (Lorain county)
Steubenville-Weirton MSA (Jefferson county)
Youngstown-Warren MSA (Mahoning and Trumbull counties)

3. NORTHWEST OHIO
Lima MSA (Allen and Auglaize counties)
Toledo MSA (Fulton, Lucas, and Wood counties)

4. SOUTHWEST OHIO
Cincinnati PMSA (Clermont, Hamilton, Warren counties)
Dayton-Springfield MSA (Clark, Greene, Miami, and Montgomery counties)

5. BALANCE OF OHIO
Mansfield MSA (Richland county)
Parkersburg-Marietta MSA (Washington county)
All Non-MSA Counties: Adams, Ashland, Ashtabula, Athens, Belmont, Brown, Butler, Champaign, Clinton, Columbiana, Coshocton, Crawford, Darke, Defiance, Erie, Fayette, Gallia, Guernsey, Hancock, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Huron, Jackson, Knox, Lawrence, Logan, Marion, Meigs, Mercer, Monroe, Morgan, Morrow, Muskingum, Noble, Ottawa, Paulding, Perry, Pike, Preble, Putnam, Ross, Sandusky, Scioto, Seneca, Shelby, Tuscarawas, Van Wert, Vinton, Wayne, Williams, and Wyandot.

Diagram I-B
State Geographic Regions

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The latter region included those among the vocational graduates who were identified as non-Ohio residents, since their listed zip codes were not among those identifying the five Ohio regions.

The IRS Statistics of Income Division reviewed all tables to assure that no cell contained data on less than 10 individuals, in compliance with disclosure requirements. When necessary, data cells were combined. Furthermore, all tables were scrutinized and cleared by the IRS Disclosure Division before their release.

In Chapter II, we will report on and analyze the earnings and geographic mobility of the 1979 Secondary Vocational graduates in 1988, nine years following their graduation. Chapter III will deal with the income and geographic mobility of the two Associate Vocational programs. In each of these, the performance in 1988 of the 1979 vocational graduates will be compared with their performance in 1987, 1986, 1985, 1984 and 1983.

The final chapter, Chapter IV, presents a summary of the findings, conclusions and recommendations.

CHAPTER II

THE 1979 SECONDARY VOCATIONAL EDUCATION GRADUATES

CHAPTER II

THE 1979 SECONDARY VOCATIONAL EDUCATION GRADUATES

The study included 13,109 graduates in 1979 of twelve Secondary Vocational programs in Ohio. In this chapter, we will report on and analyze the earnings of the 1979 Secondary Vocational graduates in 1988, nine years following their graduation. The earnings and geographic mobility in 1988 of the 1979 Secondary Vocational graduates will be compared with their performance in 1987, 1986, 1985, 1984 and 1983.

Table II-A lists the Secondary Vocational programs included in the study, the number of graduates, and the percentage of females and males in each program. Diagram II-B is a bar chart of the number of completers in each of the study's twelve Secondary Vocational programs. Diagram II-C shows the percentage of females and males in each of the study's programs. Table II-D presents the distribution of the 1979 Secondary Vocational education graduates by vocational program and training region. Diagram II-E shows the geographical distribution of graduates of the Secondary Vocational programs included in the study.

TABLE II-A

STUDY OF 1979 SECONDARY VOCATIONAL EDUCATION GRADUATES BY PROGRAM AND GENDER

VOCATIONAL PROGRAM	NUMBER OF GRADUATES	PERCENTAGE FEMALES	PERCENTAGE MALES
Agricultural Production and Horticulture	575	51.09%	48.91%
Marketing	2,159	56.60%	43.40%
Health Occupations Education	1,142	95.33%	4.67%
Home Economics Education	2,171	80.20%	19.80%
Accounting, Computing and Business Data Processing	1,007	63.33%	36.67%
General Office Clerical, Stenographic, Secretarial, and Related Occupations	1,567	98.10%	1.90%
Auto Mechanics	622	0.90%	99.10%
Carpentry	520	0.20%	99.80%
Electronics	674	2.60%	97.40%
Machine Shop	803	1.46%	98.54%
Cosmetology	899	98.94%	1.06%
Occupational Work Experience	970	28.47%	71.53%
TOTAL	13,109	58.86%	41.14%

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data by I.A. Ghazalah, Ohio University

DIAGRAM II-B
Study of 1979 Secondary Vocational Graduates
Number of Completers by Program

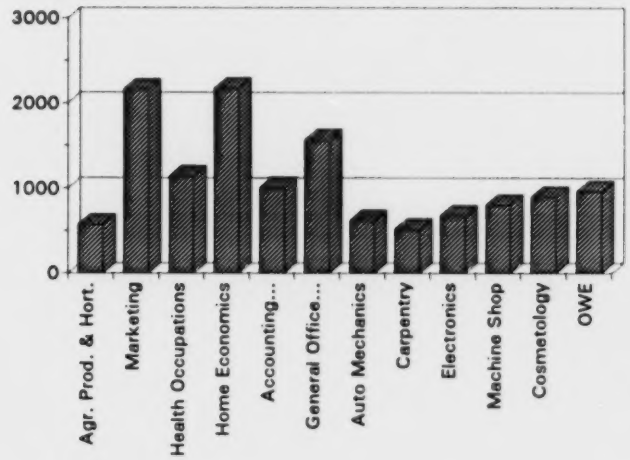

DIAGRAM II-C
Study of 1979 Secondary Vocational Graduates
Percentage of Females and Males by Program

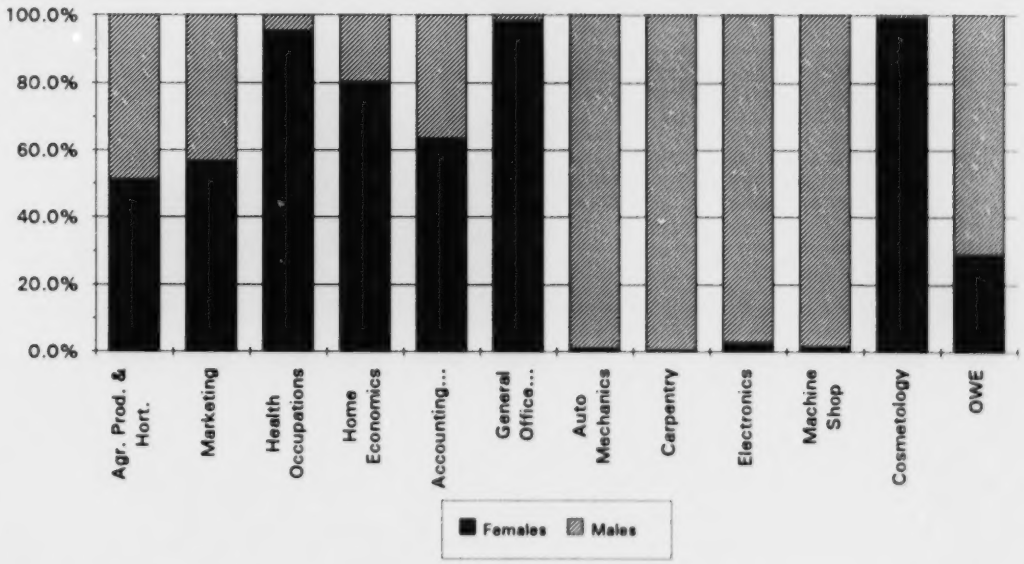

TABLE II-D

STUDY OF 1979 SECONDARY VOCATIONAL GRADUATES
DISTRIBUTION BY VOCATIONAL PROGRAM AND GEOGRAPHICAL REGION

VOCATIONAL EDUCATION PROGRAM	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO	ALL REGIONS
1. Agricultural Production and Horticulture	74	49	23	166	263	575
2. Marketing	73	299	52	186	1,549	2,159
3. Health Occupations Education	91	162	49	99	741	1,142
4. Home Economics Education	69	306	74	248	1,474	2,171
5. Accounting, Computing and Business Data Processing	53	104	41	133	686	1,007
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	81	253	7	154	1,072	1,567
7. Auto Mechanics	38	43	22	59	460	622
8. Carpentry	48	–	32	75	365	520
9. Electronics	61	83	38	84	408	674
10. Machine Shop	50	128	13	57	555	803
11. Cosmetology	40	124	41	94	600	899
12. Occupational Work Experience	46	145	27	40	712	970
TOTAL	724	1,696	419	1,395	8,875	13,109

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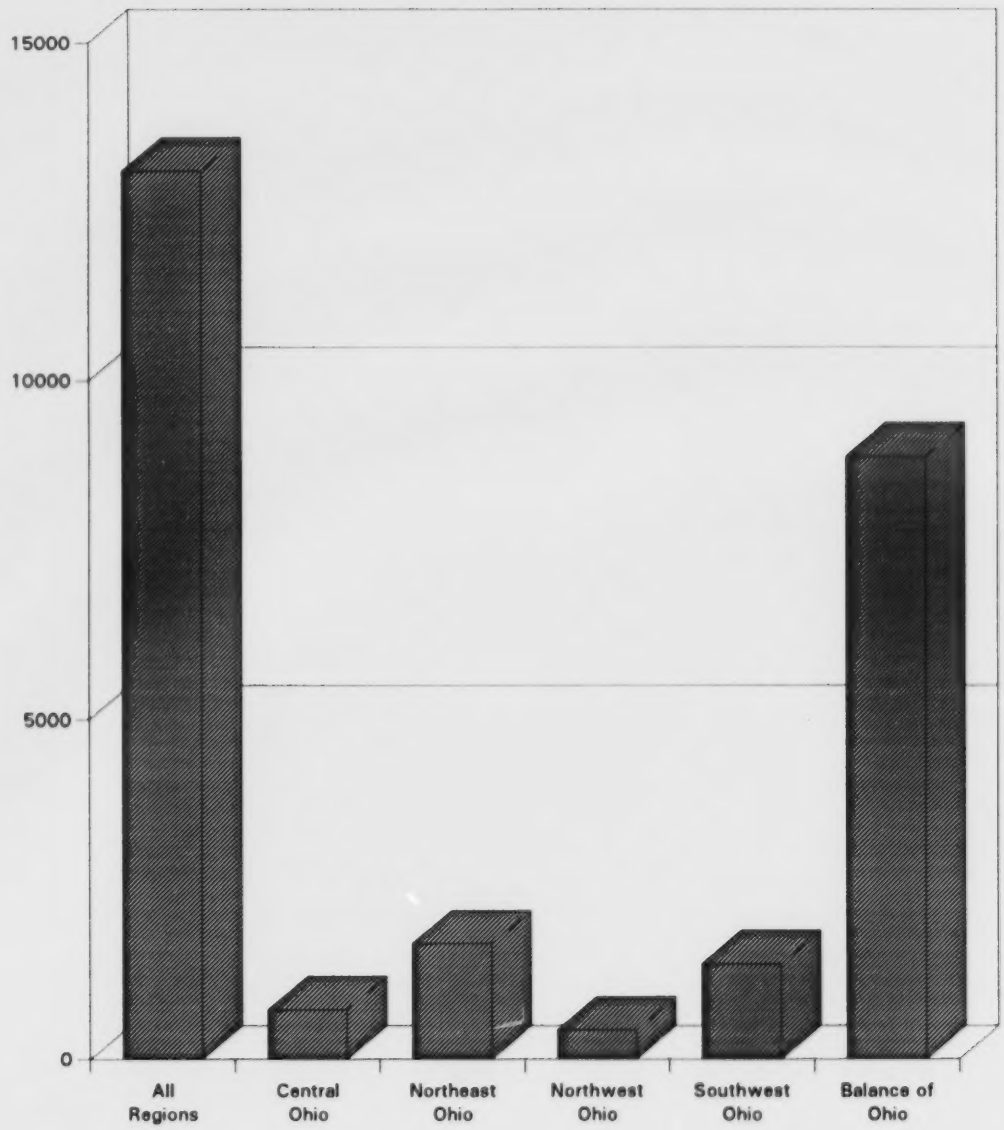
DIAGRAM II-E
Study of 1979 Secondary Vocational Graduates
Distribution by Geographical Region



A. INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES: 1988 INCOME TABULATIONS

The data provided by the Internal Revenue Service were used to determine the economic performance of the 1979 Secondary Vocational graduates nine years following their graduation.

Tables IIA-1 through IIA-12 present data on the 1988 Tax Year reported income of the 1979 Secondary Vocational graduates for each of the twelve programs. Reported income is the sum of wages and salaries, interest and dividends, and other income (miscellaneous income from work provided by other than as employees) as reported to the Internal Revenue Service.

Table IIA-9, for example, provides the reported income of those who completed the Electronics program. For the entire group of completers, the mean reported income in 1988 was $23,623. Among the group, reported income varied as follows: 10.31% received less than $5,500 (a mean of $4,909), 3.05% between $5,500 and $8,499 (a mean of $7,326), another 2.88% between $8,500 and $9,999 (a mean of $9,604), 3.21% between $10,000 and $12,999 (a mean of $10,990), 6.77% between $13,000 and $14,499 (a mean of $14,339), 5.41% between $14,500 and $15,999 (a mean of $15,767), 17.09% between $16,000 and $21,999 (a mean of $21,868), 11.34% between $22,000 and $23,999 (a mean of $23,952), and 39.94% had a reported income of at least $24,000 with a mean of $35,020.

The table also shows the distribution of the reported income among the 1979 Electronics program completers who resided outside Ohio in 1988 as compared to those who resided in the State (a mean reported income of $25,074 and $23,325, respectively). The reported incomes of the Ohio residents are then shown by the region of their residence.

A tabulation of the mean reported income by program and region is given in Table IIA-13. Diagram IIA-A is a bar graph of mean reported incomes of completers of each of the twelve Secondary Vocational programs studied.

TABLE IIA-1
AGRICULTURAL PRODUCTION AND HORTICULTURE
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	21.40% $3,262	26.42% $2,594	21.48% $5,435	4.77% $1,330		23.07% $1,231		
$5,500-6,999	5.81 6,851	11.32 8,413	5.84 6,934	9.52 6,672			42.43% $3,090	22.76% $4,273
$7,000-8,499	5.12 9,681			.11.90 9,050			9.09 9,543	4.91 8,314
$8,500-9,999			11.41 11,314					
$10,000-11,499	6.28 11,103	18.87 13,033		23.81 12,005				17.86 11,857
$11,500-12,999	6.98 12,829		7.16 12,893					
$13,000-14,499	6.51 14,445		6.37 14,436	19.05 15,162	100% 14,037			
$14,500-15,999	7.67 15,951	18.86 18,494	7.96 15,809			30.77 17,905	15.15 18,527	8.93 14,866
$16,000-18,999	16.51 18,867		16.97 21,848	11.90 19,269				19.20 17,844
$19,000-21,999		13.21 23,836				23.08 21,322		14.73 23,277
$22,000-23,999	7.91 23,904		7.96 23,860	19.05 33,503		23.08 28,964	33.33 29,292	
$24,000 and over	15.81 35,931	11.32 47,761	14.85 35,650					11.61 33,997
TOTAL	100% $16,035	100% $16,140	100% $15,772	100% $16,198	100% $14,037	100% $17,399	100% $14,748	100% $15,628

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TABLE IIA-2
MARKETING
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	21.67% $3,401	20.87% $5,036	22.75% $3,200	20.74% $2,694		13.92% $2,905	9.10% $1,916	19.24% $3,363
$5,500-6,999	5.21 7,480				30.77% $6,685	3.16 6,718		11.41 7,707
$7,000-8,499		13.51 10,083	5.17 7,942	12.20 8,337		10.13 8,110	18.18 8,879	
$8,500-9,999	6.04 9,608		6.08 9,526		15.38 9,926			
$10,000-11,499	6.69 11,106		6.50 11,181	3.66 11,414		18.99 11,429	9.09 12,486	12.10 11,345
$11,500-12,999	4.97 12,824	9.65 13,760	11.46 13,970	13.41 14,180				
$13,000-14,499	6.22 14,415						9.09 15,561	20.50 14,825
$14,500-15,999	7.82 15,897	7.72 15,896	7.83 15,933	19.51 18,081		27.22 16,929		
$16,000-18,999	15.21 18,963	17.37 19,896	14.82 18,896		30.77 18,898		9.09 17,605	9.56 18,717
$19,000-21,999			8.18 21,853	13.41 22,434		12.66 22,423	15.15 22,460	12.9 22,918
$22,000-23,999	7.64 23,806	30.88 41,616	17.21 36,917					
$24,000 and over	18.53 38,020			17.07 35,786	23.08 28,577	13.92 35,717	30.30 34,998	14.29 34,613
TOTAL	100% $16,975	100% $21,298	100% $16,217	100% $16,540	100% $15,994	100% $16,027	100% $19,945	100% $15,631

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TABLE IIA-3
HEALTH OCCUPATIONS EDUCATION
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	24.79% $3,062	28.57% $3,586	24.87% $3,673	27.03% $4,014	33.33% $3,200	19.35% $3,641	16.66% $3,593	31.20% $4,214
$5,500-6,999							10.00 8,071	
$7,000-8,499	12.22 8,321	12.50 9,491	12.44 8,482			20.97 8,659		6.65 8,311
$8,500-9,999	5.38 9,587							6.19 9,808
$10,000-11,499			11.93 11,634	13.51 11,558	26.67 11,641	8.06 12,060		5.96 11,421
$11,500-12,999	6.73 12,196	15.18 13,237					33.34 12,273	
$13,000-14,499	7.17 14,024		13.97 15,061	16.22 14,767		20.97 14,321		5.96 14,117
$14,500-15,999	7.17 15,189	16.96 16,637						12.16 15,549
$16,000-18,999	18.49 19,815		19.10 18,245	35.13 19,896		14.52 18,871	13.33 16,131	12.39 18,561
$19,000-21,999		18.75 23,515	6.41 23,650		20.00 21,664		26.67 22,352	
$22,000-23,999	6.73 23,314			8.11 35,452		11.29 23,767		19.49 32,381
$24,000 and over	11.32 32,839	8.04 34,985	11.28 32,651		20.00 29,638	4.84 35,811		
TOTAL	100% $14,157	100% $14,264	100% $14,144	100% $14,906	100% $14,432	100% $13,652	100% $13,609	100% $14,498

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TABLE IIA-4
HOME ECONOMICS EDUCATION
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean		Outside Ohio Percent/Ohio		All Ohio Percent/Mean		Central Ohio Percent/Mean		Northeast Ohio Percent/Mean		Northwest Ohio Percent/Mean		Southwest Ohio Percent/Mean		Balance of Ohio Percent/Mean	
Under $5,500	28.25%	$3,891	19.84%	$4,190	29.71%	$3,862	27.95%	3,225	20.83%	$3,663			17.65%	$3,014	21.84%	$3,157
$5,500-6,999	6.11	6,771	3.38	6,771	6.59	6,564	7.35	6,910			30.54%	$3,975			7.83	6,801
$7,000-8,499			7.59	8,205					12.50	8,122			17.66	8,037		
$8,500-9,999	6.74	9,088			6.59	9,225	8.82	9,537			9.26	8,919			15.42	9,279
$10,000-11,499	7.24	11,012	8.44	11,032	7.76	11,173	5.88	12,157	12.50	9,449			11.76	11,056		
$11,500-12,999	6.05	12,706							12.50	12,472	5.56	11,194			16.13	12,419
$13,000-14,499	6.80	14,242			12.96	14,130					5.56	12,658				
$14,500-15,999	6.30	15,535	15.61	15,657	6.08	15,708	11.76	15,255	12.50	15,199	11.12	14,890	17.64	15,611	20.04	16,930
$16,000-18,999	13.23	18,396	16.87	18,650	12.59	18,637	14.71	18,629			15.74	18,649				
$19,000-21,999													8.82	20,355		
$22,000-23,999	5.80	23,144	9.70	23,633	5.63	23,618	13.24	23,526	16.67	23,672	10.19	23,641			7.71	22,901
$24,000 and over	13.48	60,882	18.57	46,632	12.08	64,861	10.29	29,992	12.50	48,542	12.03	38,593	26.47	35,483	11.03	84,548
TOTAL	100%	$17,621	100%	$19,154	100%	$17,352	100%	$13,701	100%	$16,430	100%	$15,009	100%	$17,193	100%	$19,140

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TABLE IIA-5
ACCOUNTING, COMPUTING AND BUSINESS DATA PROCESSING
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean		Outside Ohio Percent/Ohio		All Ohio Percent/Mean		Central Ohio Percent/Mean		Northeast Ohio Percent/Mean		Northwest Ohio Percent/Mean		Southwest Ohio Percent/Mean		Balance of Ohio Percent/Mean	
Under $5,500	18.06%	$4,081	16.78%	$3,451	18.3%	$4,142	14.82%	$2,489	28.57%	$1,512	14.03%	$4,877	14.28%	$3,453	16.46%	$4,042
$5,500-6,999	3.99	6,918	8.76	8,749	4.04	6,881							10.71	7,585	4.36	6,505
$7,000-8,499	5.63	8,418			5.73	8,392			21.43	8,699	7.02	9,117			6.05	8,200
$8,500-9,999	4.69	11,264			4.33	10,752	9.26	11,162							9.93	10,909
$10,000-11,499			17.52	12,393							7.02	12,160				
$11,500-12,999	4.92	12,905			4.75	12,653	12.96	14,118					17.86	13,799	13.32	14,474
$13,000-14,499	4.45	14,322			4.33	14,180					21.05	15,543				
$14,500-15,999	8.32	15,785	5.84	15,850	8.80	15,703							14.29	18,800	22.28	17,841
$16,000-18,999	20.98	19,330	13.87	18,805	22.35	19,147	9.26	17,028			14.04	18,464				
$19,000-21,999			11.68	23,718			24.07	20,348	21.43	23,355	8.77	22,988	17.86	21,994	10.41	21,915
$22,000-23,999	9.38	23,696			8.94	23,427										
$24,000 and over	19.58	34,151	21.55	34,558	18.43	34,855	29.63	32,399	28.57	32,593	28.07	32,044	25.00	37,847	17.19	31,397
TOTAL	100%	$17,565	100%	$18,525	100%	$17,382	100%	$19,306	100%	$16,613	100%	$19,053	100%	$19,847	100%	$16,109

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TABLE IIA-6
GENERAL OFFICE, CLERICAL, STENOGRAPHIC, SECRETARIAL AND RELATED OCCUPATIONS
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	18.53% $3,861	13.13% $4,193	19.38% $3,789	17.11% $3,621		15.70% $3,216	14.55% $4,016	15.70% $3,210
$5,500-6,999	3.70 6,770	3.43 8,161	3.75 6,756				9.09 7,569	3.67 6,823
$7,000-8,499	5.44 9,542		5.39 9,376	5.26 8,965		18.18 8,709		4.17 8,306
$8,500-9,999		10.29 9,766						5.51 11,108
$10,000-11,499	4.81 11,325		4.84 11,022	19.73 12,381		9.09 12,366	5.45 11,501	
$11,500-12,999	5.04 12,642	6.86 12,866	4.75 12,729					4.67 12,016
$13,000-14,499	6.70 14,408	8.00 14,297	6.49 14.430	15.79 15,616	100% $15,563		9.09 13,401	6.34 13,700
$14,500-15,999	9.61 15,689	8.57 15,716	9.78 15,801			29.76 16,439		10.52 15,319
$16,000-18,999	24.19 18,752	24.00 18,807	24.23 18,550				36.37 16,666	26.71 18,801
$19,000-21,999				14.47 21,804		13.22 20,458		9.02 21,741
$22,000-23,999	9.22 23,756	6.86 23,837	9.60 23,630	10.53 23,523		14.05 26,649	10.91 22,218	
$24,000 and over	12.76 33,727	18.86 41,041	11.79 32,484	17.11 31,974			14.54 28,291	13.69 29,588
TOTAL	100% $16,170	100% $19,098	100% $15,706	100% $17,102	100% $15,563	100% $14,554	100% $15,716	100% $15,787

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TABLE IIA-7
AUTO MECHANICS
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	10.51% $4,045	17.19% $5,899	10.46% $3,700			12.19% $5,051		11.15% $4,799
$5,500-6,999								
$7,000-8,499	5.74 8,953		2.83 7,973	7.50% $7,113				
$8,500-9,999		4.69 9,463	2.40 9,519	7.50 10,568				2.79 9,900
$10,000-11,499	2.49 11,190		2.61 11,219					
$11,500-12,999	3.44 12,503		7.41 13,701				13.64% $13,966	4.64 11,505
$13,000-14,499	3.82 14,198				100% 21,807	7.32 13,191		4.64 13,322
$14,500-15,999	7.07 15,404	25.00 16,623	14.38 15,353			17.07 17,575	27.27 17,720	32.51 16,997
$16,000-18,999	21.61 19,691			37.50 17,856				
$19,000-21,999			13.94 21,785	20.00 23,929		26.83 22,815	13.64 20,482	22.60 23,092
$22,000-23,999	14.15 23,298	26.56 22,716	14.16 23,407				45.45 29,879	
$24,000 and over	31.17 34,163	26.56 33,776	31.81 34,222	27.50 30,843		36.59 38,652		21.67 32,741
TOTAL	100% $21,476	100% $20,618	100% $21,594	100% $21,289	100% $21,807	100% $24,845	100% $23,111	100% $19,803

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TABLE IIA-8
CARPENTRY
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	9.54% $5,181	5.97% $5,414	9.93% $5,870	10.65% $4,255	100% $24,008	100% $20,982	14.30% $5,898	10.06% $4,932
$5,500-6,999		7.46 8,210						
$7,000-8,499								8.21 9,399
$8,500-9,999		5.97 11,190		8.51 11,158				
$10,000-11,499	5.91 11,403		13.94 11,431				10.71 11,255	4.48 11,957
$11,500-12,999	7.95 12,519							
$13,000-14,499								8.21 15,260
$14,500-15,999	1.82 15,023	7.46 15,238	13.13 17,864	14.89 16,966			32.14 18,457	5.97 17,877
$16,000-18,999	12.05 17,452	23.88 20,170						15.30 19,714
$19,000-21,999	15.23 20,693		15.82 20,788	34.04 23,194			10.71 23,316	15.30 23,128
$22,000-23,999	15.00 23,244	20.90 23,601	15.28 23,419					
$24,000 and over	32.50 34,625	28.36 38,023	31.90 34,434	31.91 34,429			32.14 37,498	32.47 32,042
TOTAL	100% $22,431	100% $23,273	100% $22,373	100% $22,810	100% $24,008	100% $20,982	100% $22,530	100% $21,082

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TABLE IIA-9
ELECTRONICS
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	10.31% $4,909	3.77% $3,250	11.73% $5,026	7.85% $5,623			11.42% $3,454	9.59% $3,528
$5,500-6,999	3.05 7,326	6.60 7,920	2.89 7,158			7.81% $6,480		6.86 8,125
$7,000-8,499							11.43 9,436	
$8,500-9,999	2.88 9,604	4.72 10,460	5.78 10,571			6.25 10,684		
$10,000-11,499	3.21 10,990			9.80 10,245				2.05 10,833
$11,500-12,999				5.88 13,414				3.08 12,192
$13,000-14,499	6.77 14,339	15.10 14,672	6.19 14,709			6.25 13,856	14.29 14,221	
$14,500-15,999	5.41 15,767				100.00% 22,873	6.25 15,479		6.16 15,604
$16,000-18,999	17.09 21,868	23.58 19,745		25.49 17,589		15.63 18,577		29.11 20,988
$19,000-21,999			21.03 21,614			14.06 23,493	14.29 23,071	
$22,000-23,999	11.34 23,952	10.38 23,787	19.39 23,829	13.73 23,587				43.15 34,090
$24,000 and over	39.94 35,020	35.85 40,711	32.99 35,893	37.25 34,856		43.75 33,660	48.57 36,037	
TOTAL	100% $23,623	100% $25,074	100% $23,325	100% $22,940	100% $22,873	100% $23,941	100% $24,305	100% $23,274

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TABLE IIA-10
MACHINE SHOP
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	8.44% $3,670	9.91% $3,653	8.25% $3,721	6.52% $2,770		8.45% $3,539		6.79% $4,436
$5,500-6,999		10.99 8,374				3.61 8,051		
$7,000-8,499	4.45 7,991		3.46 9,496					1.41 9,206
$8,500-9,999	2.73 10,218							
$10,000-11,499			3.14 11,118	8.70 11,133		6.02 10,748		3.99 10,430
$11,500-12,999	3.59 11,899	5.49 12,649	3.30 12,438					11.98 13,907
$13,000-14,499	3.59 13,829	5.49 15,618	3.30 14,132		100% $26,180	3.61 13,987	100% $27,214	
$14,500-15,999	4.02 14,809		4.13 15,233	8.70 15,433		4.82 16,215		
$16,000-18,999	3.16 17,284							24.89 20,895
$19,000-21,999	8.18 20,226	23.07 21,767	11.55 21,350	10.86 21,067				
$22,000-23,999	12.77 22,644	45.05 37,996	20.13 23,440	15.22 23,517		22.89 22,225		
$24,000 and over	49.07 36,961		42.74 37,720	50.00 36,206		50.60 35,685		50.94 34,165
TOTAL	100% $25,692	100% $24,973	100% $25,797	100% $26,462	100% $26,180	100% $25,667	100% $27,214	100% $25,117

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TABLE IIA-11
COSMETOLOGY
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	30.64% $2,858	29.58% $2,875	30.76% $2,856	26.67% $2,469		34.36% $3,788		
$5,500-6,999	9.05 6,825	12.68 6,735	8.59 6,891			4.69 7,480		34.83% $4,132
$7,000-8,499	8.10 9,429	4.23 9,456	8.59 9,616	10.0 8,015				
$8,500-9,999						17.19 9,646		11.18 8,590
$10,000-11,499	6.98 11,056	5.63 11,321	7.51 11,029	23.33 12,399				17.57 11,210
$11,500-12,999	7.14 12,596	14.08 14,147	7.69 12,642			21.88 13,565		
$13,000-14,499	6.51 14,221		6.44 14,134					6.07 13,601
$14,500-15,999	7.14 15,659		7.16 15,698	16.67 14,745	100% $11,302		100% $11,751	7.67 15,358
$16,000-18,999	15.24 19,450	16.90 20,783	15.03 19,580	13.33 18,406		17.19 19,193		14.05 18,628
$19,000-21,999				10.00 22,066				2.88 22,749
$22,000-23,999	3.17 23,432	11.27 23,773	2.68 23,452					
$24,000 and over	6.03 34,811	5.63 43,889	5.55 33,779			4.69 33,114		5.75 34,334
TOTAL	100% $11,778	100% $13,396	100% $11,577	100% $11,471	100% $11,302	100% $11,131	100% $11,751	100% $11,619

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TABLE IIA-12
OCCUPATIONAL WORK EXPERIENCE
1979 SECONDARY VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	24.66% $3,489	25.46% $4,485	29.05% $4,457			15.28% $3,447	35.30% $3,018	20.14% $3,601
$5,500-6,999	3.85 8,232					6.94 7,834		3.55 6,834
$7,000-8,499		2.73 9,358						6.87 8,371
$8,500-9,999	5.17 9,624		5.59 9,720	18.75% $11,808		6.94 9,591		5.69 9,795
$10,000-11,499	6.50 11,354	16.36 11,533	6.21 11,134			5.56 10,444		
$11,500-12,999	5.84 12,697		5.43 12,694			5.56 12,142		5.92 12,867
$13,000-14,499	5.44 14,210	10.91 15,343	5.43 14,381			8.33 13,339		6.64 13,613
$14,500-15,999	5.57 15,513		5.59 15,908	18.75 17,063		18.05 16,042		5.69 15,343
$16,000-18,999	16.58 21,063	15.45 19,886	16.77 20,806		55.56% $17,246		29.41 18,182	28.91 18,094
$19,000-21,999						15.28 19,870		
$22,000-23,999	8.89 23,618	11.82 23,766	9.0 23,694	62.50 25,928	44.44 22,870			
$24,000 and over	17.50 34,885	17.27 37,073	16.93 34,515			18.06 28,779	35.29 28,667	16.59 35,484
TOTAL	100% $16,488	100% $17,242	100% $16,354	100% $21,618	100% $19,745	100% $15,232	100% $16,529	100% $15,757

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by I.A. Ghazalah, Ohio University

TABLE IIA-13

MEAN REPORTED INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1988 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	$16,035	$16,140	$15,772	$16,198	$14,037	$17,399	$14,748	$15,628
2. Marketing	$16,975	$21,298	$16,217	$16,540	$15,994	$16,027	$19,945	$15,631
3. Health Occupations Education	$14,157	$14,264	$14,144	$14,906	$14,432	$13,652	$13,609	$14,498
4. Home Economics Education	$17,621	$19,154	$17,352	$13,701	$16,430	$15,009	$17,193	$19,140
5. Accounting, Computing and Business Data Processing	$17,565	$18,525	$17,382	$19,306	$16,613	$19,053	$19,847	$16,109
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$16,170	$19,098	$15,706	$17,102	$15,563	$14,554	$15,716	$15,787
7. Auto Mechanics	$21,476	$20,618	$21,594	$21,289	$21,807	$24,845	$23,111	$19,803
8. Carpentry	$22,431	$23,273	$22,373	$22,810	$24,008	$20,982	$22,530	$21,082
9. Electronics	$23,623	$25,074	$23,325	$22,940	$22,873	$23,941	$24,305	$23,274
10. Machine Shop	$25,692	$24,973	$25,797	$26,462	$26,180	$25,667	$27,214	$25,117
11. Cosmetology	$11,778	$13,396	$11,577	$11,471	$11,302	$11,131	$11,751	$11,619
12. Occupational Work Experience	$16,488	$17,242	$16,354	$21,618	$19,745	$15,232	$16,529	$15,757

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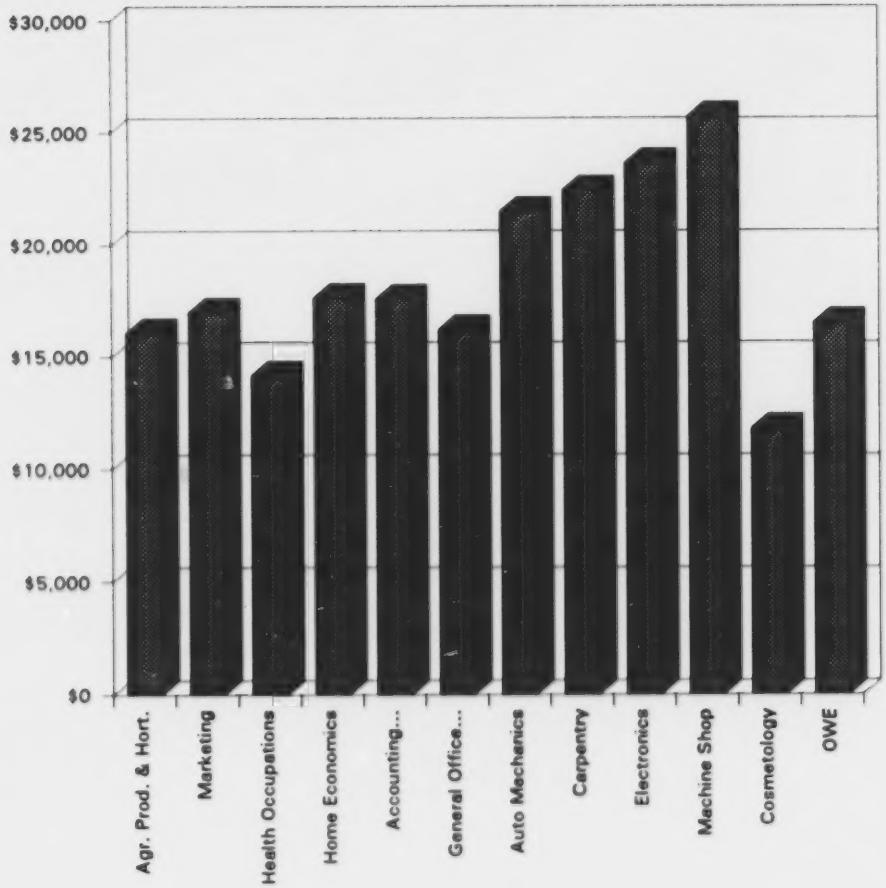
DIAGRAM IIA-A
1988 Mean Income of 1979 Secondary Vocational Graduates
by Program



B. INCOME OF THE 1979 SECONDARY VOCATIONAL EDUCATION GRADUATES: COMPARISON WITH EQUIVALENT GROUPS

The data provided by the Internal Revenue Service were used to determine the economic performance of the 1979 graduates of the Secondary Vocational programs in 1983, 1984, 1985, 1986, 1987 and 1988, four, five, six, seven, eight and nine years following their graduation.

Tables IIB-1, IIB-2, IIB-3, IIB-4, IIB-5 and IIIB-6 show the mean income by program and region of the 1979 Secondary Vocational graduates for 1983, 1984, 1985, 1986, 1987 and 1988, respectively. Table IIB-7 shows the mean income of the 1979 Secondary Vocational graduates by vocational program in 1983, 1984, 1985, 1986, 1987 and 1988.

Income data on the 1979 graduates of Secondary Vocational programs for 1983, 1984, 1985, 1986, 1987 and 1988 tax years may be analyzed using baseline data on a comparable group, i.e. one with a comparable age, educational achievement and gender composition.

The comparable educational achievement used was completion of four years of high school. The age and gender factors in income comparison were determined allowing for the characteristics of a longitudinal study.

Gender Composition

The longitudinal study of the 1979 vocational graduates began in 1983. For that year, the Internal Revenue Service data (which do not include gender breakdown) were provided on 99.13% of the study population. With the decline in this percentage in subsequent years, adjustments for changes in the gender ratio of provided data became necessary for appropriate calculations of the relative incomes.

The gender composition change was estimated as follows:

(i) Single-gender dominated Secondary Vocational programs were utilized to estimate gender composition change over time for each of the programs.

(ii) Single-gender dominated programs were identified: Health Occupations Education; General Office Clerical, Stenographic, Secretarial and Related Occupations; and Cosmetology (with a female percentage of 95.33, 98.10 and 98.94, respectively) were identified as female-dominated. Auto Mechanics, Carpentry, Electronics and Machine Shop with 99.10%, 99.80%, 97.40% and 98.54% male, respectively, were identified as male-dominated programs.

TABLE IIB-1

MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1983 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	$7,782	$9,483	$7,682	$8,390	$6,338	$9,248	$7,595	$7,878
2. Marketing	$7,697	$9,547	$7,338	$7,030	$7,574	$4,796	$9,196	$7,224
3. Health Occupations Education	$7,882	$8,800	$7,728	$6,683	$8,13		$9,855	$7,683
4. Home Economics Education	$6,669	$7,983	$6,417	$6,167	$6,660	$8,713	$5,483	$6,384
5. Accounting, Computing and Business Data Processing	$9,235	$8,358	$9,061	$11,272	$9,020	$8,358	$11,598	$9,078
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$8,674	$8,520	$8,696	$11,355	$6,822	$69,37	$9,071	$8,991
7. Auto Mechanics	$10,370	$9,844	$10,441	$9,157	$9,865	$12,030	$10,888	$10,489
8. Carpentry	$10,148	$13,378	$9,288	$11,367		$7,132	$9,794	$9,466
9. Electronics	$11,060	$11,252	$11,024	$9,774	$11,655	$8,502	$10,409	$11,194
10. Machine Shop	$11,396	$11,413	$11,393	$7,118	$11,530	$13,441	$12,598	$11,406
11. Cosmetology	$6,946	$5,703	$7,128	$6,092	$6,901		$9,929	$7,046
12. Occupational Work Experience	$8,108	$7,731	$8,181	$14,283	$7,321	$8,364	$5,573	$8,238

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TABLE IIB-2

MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1984 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	$9,933	$9,438	$9,891	$10,037	$11,498	$10,176	$10,569	$9,625
2. Marketing	$10,077	$11,229	$9,792	$9,595	$7,840	$9,597	$11,929	$9,755
3. Health Occupations Education	$9,412	$8,439	$9,566	$11,034	$9,045	$9,460	$9,292	$9,498
4. Home Economics Education	$9,171	$9,835	$9,010	$8,706	$11,397	$9,979	$7,715	$8,871
5. Accounting, Computing and Business Data Processing	$11,038	$11,040	$11,037	$10,393	$13,303	$11,570	$12,113	$10,892
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$10,511	$11,153	$10,385	$10,157	$11,183	$10,430	$10,403	$10,375
7. Auto Mechanics	$13,306	$12,570	$13,446	$13,692	$16,047	$15,032	$13,774	$13,142
8. Carpentry	$13,215	$12,083	$13,257	$13,399	$10,680	$20,323	$14,999	$13,040
9. Electronics	$13,938	$12,265	$14,334	$13,771	$12,882	$15,251	$13,826	$14,359
10. Machine Shop	$15,354	$13,228	$15,712	$15,407	$16,195	$14,819	$14,326	$15,983
11. Cosmetology	$8,656	$7,766	$8,804	$9,064	$9,207	$8,463	$7,008	$8,893
12. Occupational Work Experience	$11,096	$11,164	$11,090	$12,962	$11,242	$11,011	$13,106	$10,925

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TABLE IIB-3

MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1985 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	$11,795	$11,448	$11,866	$13,631	$11,477	$10,025	$12,126	$11,982
2. Marketing	$12,386	$13,582	$12,087	$12,119	$10,771	$12,893	$12,465	$11,996
3. Health Occupations Education	$10,738	$10,360	$10,810	$11,736	$10,543	$10,415	$11,846	$10,620
4. Home Economics Education	$11,003	$11,544	$10,876	$11,437	$13,482	$10,736	$10,168	$10,421
5. Accounting, Computing and Business Data Processing	$13,623	$14,151	$13,499	$11,874	$11,613	$13,979	$17,232	$13,199
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$12,370	$12,832	$12,282	$13,443	$12,086	$10,153	$12,636	$11,386
7. Auto Mechanics	$16,340	$15,668	$16,468	$15,741	$21,663	$20,263	$15,932	$15,971
8. Carpentry	$17,139	$16,366	$17,310	$16,011	$17,798	$21,261	$17,182	$17,019
9. Electronics	$18,120	$17,640	$18,240	$17,790	$16,038	$18,570	$18,354	$18,569
10. Machine Shop	$18,826	$18,572	$18,878	$19,314	$19,660	$18,283	$15,558	$18,421
11. Cosmetology	$9,820	$9,191	$9,931	$10,331	$9,601	$9,485	$10,288	$9,758
12. Occupational Work Experience	$12,931	$13,250	$12,861	$13,268	$12,817	$11,977	$14,343	$12,708

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TABLE IIB-4

MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1986 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	$13,781	$12,449	$13,997	$13,745	$14,213	$15,013	$12,823	$12,613
2. Marketing	$13,904	$15,201	$13,744	$15,092	$12,149	$14,298	$16,582	$12,895
3. Health Occupations Education	$11,403	$10,631	$11,600	$13,192	$12,424	$11,564	$11,594	$11,402
4. Home Economics Education	$12,263	$15,399	$11,478	$11,049	$15,962	$12,687	$10,043	$11,270
5. Accounting, Computing and Business Data Processing	$15,170	$15,897	$14,930	$14,970	$17,544	$15,113	$17,523	$14,472
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$13,049	$13,507	$12,785	$13,555	$13,395	$12,403	$15,382	$12,345
7. Auto Mechanics	$18,018	$16,725	$18,265	$18,494	$18,499	$19,256	$18,296	$17,951
8. Carpentry	$18,414	$17,038	$18,718	$19,327	$16,240	$23,023	$20,023	$18,066
9. Electronics	$19,675	$18,459	$19,989	$19,203	$19,244	$19,603	$20,308	$19,631
10. Machine Shop	$20,629	$19,156	$21,365	$21,831	$21,377	$21,030	$20,819	$21,176
11. Cosmetology	$10,301	$10,095	$10,547	$11,393	$10,895	$10,466	$10,532	$10,261
12. Occupational Work Experience	$14,165	$14,408	$14,058	$15,616	$15,933	$13,998	$17,190	$13,339

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data by I.A Ghazalah, Ohio University

TABLE IIB-5

MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1987 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	$14,740	$16,159	$14,529	$15,408	$14,820	$14,196	$13,921	$14,664
2. Marketing	$15,139	$17,443	$15,093	$14,850	$14,123	$14,286	$17,584	$15,101
3. Health Occupations Education	$13,046	$13,177	$13,025	$13,087	$13,241	$12,712	$13,037	$12,857
4. Home Economics Education	$13,852	$17,438	$13,093	$12,135	$14,452	$12,677	$11,089	$13,205
5. Accounting, Computing and Business Data Processing	$16,540	$17,215	$16,296	$18,204	$16,559	$16,046	$17,950	$15,925
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$14,941	$16,009	$14,533	$14,697	$14,614	$13,060	$15,793	$14,399
7. Auto Mechanics	$19,949	$17,849	$20,029	$20,247	$18,192	$23,273	$22,618	$18,687
8. Carpentry	$20,368	$19,822	$20,508	$20,689	$18,833	$21,318	$19,027	$20,110
9. Electronics	$21,438	$21,869	$20,982	$20,673	$21,347	$21,143	$20,819	$20,517
10. Machine Shop	$23,686	$23,884	$23,650	$23,748	$23,927	$23,271	$21,603	$23,081
11. Cosmetology	$11,188	$11,824	$10,957	$10,701	$12,319	$9,615	$13,391	$10,730
12. Occupational Work Experience	$15,625	$16,165	$15,271	$16,011	$15,803	$14,473	$14,652	$15,025

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data
by I. A. Shazalah, Ohio University

TABLE IIB-6

MEAN REPORTED INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1988 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	$16,035	$16,140	$15,772	$16,198	$14,037	$17,399	$14,748	$15,628
2. Marketing	$16,975	$21,298	$16,217	$16,540	$15,994	$16,027	$19,945	$15,631
3. Health Occupations Education	$14,157	$14,264	$14,144	$14,906	$14,432	$13,652	$13,609	$14,498
4. Home Economics Education	$17,621	$19,154	$17,352	$13,701	$16,430	$15,009	$17,193	$19,140
5. Accounting, Computing and Business Data Processing	$17,565	$18,525	$17,382	$19,306	$16,613	$19,053	$19,847	$16,109
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$16,170	$19,098	$15,706	$17,102	$15,563	$14,554	$15,716	$15,787
7. Auto Mechanics	$21,476	$20,618	$21,594	$21,289	$21,807	$24,845	$23,111	$19,803
8. Carpentry	$22,431	$23,273	$22,373	$22,810	$24,008	$20,982	$22,530	$21,082
9. Electronics	$23,623	$25,074	$23,325	$22,940	$22,873	$23,941	$24,305	$23,274
10. Machine Shop	$25,692	$24,973	$25,797	$26,462	$26,180	$25,667	$27,214	$25,117
11. Cosmetology	$11,778	$13,396	$11,577	$11,471	$11,302	$11,131	$11,751	$11,619
12. Occupational Work Experience	$16,488	$17,242	$16,354	$21,618	$19,745	$15,232	$16,529	$15,757

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data by I.A. Ghazalah, Ohio University

TABLE IIB-7

MEAN INCOME IN 1983, 1984, 1985, 1986, 1987 AND 1988 BY VOCATIONAL PROGRAM
1979 Secondary Vocational Graduates

VOCATIONAL PROGRAM	Mean Income in 1983	Mean Income in 1984	Mean Income in 1985	Mean Income in 1986	Mean Income in 1987	Mean Income in 1988
1. Agricultural Production and Horticulture	$7,872	$9,933	$11,795	$13,781	$14,740	$16,035
2. Marketing	$7,697	$10,077	$12,386	$13,904	$15,139	$16,975
3. Health Occupations Education	$7,882	$9,412	$10,738	$11,403	$13,046	$14,157
4. Home Economics Education	$6,669	$9,171	$11,003	$12,263	$13,852	$17,621
5. Accounting, Computing and Business Data Processing	$9,235	$11,038	$13,623	$15,170	$16,540	$17,565
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	$8,674	$10,511	$12,370	$13,049	$14,941	$16,170
7. Auto Mechanics	$10,370	$13,306	$16,340	$18,018	$19,949	$21,476
8. Carpentry	$10,148	$13,215	$17,139	$18,414	$20,368	$22,431
9. Electronics	$11,060	$13,938	$18,120	$19,675	$21,438	$23,623
10. Machine Shop	$11,396	$15,354	$18,826	$20,629	$23,686	$25,692
11. Cosmetology	$6,946	$8,656	$9,820	$10,301	$11,188	$11,778
12. Occupational Work Experience	$8,108	$11,096	$12,931	$14,165	$15,625	$16,488

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(iii) The percentage sample loss by program between 1979 and each of the study years 1983, 1984, 1985, 1986, 1987 and 1988 from all female and male dominated programs were used to calculate a weighted percentage loss of females and males. This weighted percentage loss was then used to adjust the original 1979 gender breakdown. Table IIB-8 shows the adjusted gender breakdown for 1988, 1987, 1986, 1985, 1984 and 1983 as well as the original gender breakdown at time of graduation in 1979.

Age

Incomes of the 1988 Secondary Vocational graduates were analyzed by comparison to income data on age-specific (27-year-old) high school graduates in the U.S. for 1988. Incomes of the comparable group were generated using the machine-readable data file Current Population Survey, March 1989 conducted by the Bureau of the Census for the Bureau of Labor Statistics: Current Population Survey, March 1989 Tape Technical Documentation and prepared by Data User Services Division, Data Access and Use Staff, Bureau of the Census, Washington: The Bureau, 1989.

The age-specific Bureau of the Census income data for completers of four years of high school, and the adjusted gender composition were used to calculate the U.S. basic comparison figure for each of the Secondary Vocational programs. For example, the 1988 U.S. comparison figure of $12,324 for graduates of Marketing was calculated by multiplying 0.5643 (the proportion of females) times $8,594 (the female earnings figure) and adding the result to that of multiplying .4357 (the proportion of males) times $17,157 (the male earnings figure).

Table IIB-9 shows the 1988 mean income of the comparable group (the same age, gender composition and educational achievement) for each of the twelve Secondary Vocational programs.

Next, in order to carry out the comparison over time between incomes of graduates of vocational programs in the study and those of the comparable group in the general population, we utilized the same procedure described for 1987, 1986, 1985, 1984 and 1983. Table IIB-10 shows the mean income of the comparable group (the same age, gender composition and educational achievement) for each of the Secondary Vocational programs for each of the study years 1983, 1984, 1985, 1986, 1987 and 1988 (four, five, six, seven, eight and nine years following graduation).

TABLE IIB-8

1979 SECONDARY VOCATIONAL GRADUATES:
ADJUSTED GENDER COMPOSITION (1988, 1987, 1986, 1985, 1984, 1983)
AND GENDER COMPOSITION IN 1979 BY PROGRAM

	Adjusted Gender Composition												Gender Composition of 1979 Graduates	
	1988		1987		1986		1985		1984		1983			
VOCATIONAL PROGRAM	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males
Agricultural Production and Horticulture	50.05%	49.95%	49.69%	50.31%	51.49%	48.51%	48.67%	51.33%	51.50%	48.50%	51.09%	48.91%	51.09%	48.91%
Marketing	56.43%	43.57%	56.51%	43/40%	58.10%	41.90%	55.06%	44.94%	57.28%	42.72%	56.60%	43.40%	56.60%	43.40%
Health Occupations Education	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	97.55%	2.45%	95.33%	4.67%	95.33%	4.67%
Home Economics Education	85.71%	14.29%	85.78%	14.22%	89.13%	10.87%	85.36%	14.64%	83.17%	16.83%	80.20%	19.80%	80.20%	19.80%
Accounting, Computing and Business Data Processing	64.24%	35.76%	64.23%	35.77%	65.11%	34.89%	63.18%	36.82%	64.49%	35.51%	63.33%	36.67%	63.33%	36.67%
General Office Clerical, Stenographic, Secretarial, and Related Occupations	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	98.10%	1.90%	98.10%	1.90%
Auto Mechanics	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	0.90%	99.10%	0.90%	99.10%
Carpentry	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	0.20%	99.80%	0.20%	99.80%
Electronics	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	1.63%	98.37%	2.60%	97.40%	2.60%	97.40%
Machine Shop	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	1.46%	98.54%	1.46%	98.54%
Cosmetology	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	>99.00%	<1.00%	98.94%	1.06%	98.94%	1.06%
Occupational Work Experience	23.72%	76.28%	24.05%	75.95%	23.29%	76.71%	20.75%	79.25%	28.04%	71.96%	28.47%	71.53%	28.47%	71.53%

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TABLE IIB-9

MEAN INCOME OF EQUIVALENT GROUP
BY VOCATIONAL PROGRAM
(1988)

VOCATIONAL PROGRAM	Mean Income of Equivalent Group (1988)
Agricultural Production and Horticulture	$12,871
Marketing	$12,324
Health Occupations Education	$8,594
Home Economics Education	$9,818
Accounting, Computing and Business Data Processing	$11,656
General Office Clerical, Stenographic, Secretarial, and Related Occupations	$8,594
Auto Mechanics	$17,157
Carpentry	$17,157
Electronics	$17,157
Machine Shop	$17,157
Cosmetology	$8,594
Occupational Work Experience	$15,125

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TABLE IIB-10

MEAN INCOME IN 1983, 1984, 1985, 1986, 1987 AND 1988 OF EQUIVALENT GROUPS BY VOCATIONAL PROGRAM

VOCATIONAL PROGRAM	Mean Income in 1983	Mean Income in 1984	Mean Income in 1985	Mean Income in 1986	Mean Income in 1987	Mean Income in 1988
Agricultural Production and Horticulture	$6,815	$7,767	$9,528	$9,985	$12,428	$12,871
Marketing	$6,624	$7,531	$9,164	$9,559	$11,885	$12,324
Health Occupations Education	$5,283	$5,886	$6,605	$6,863	$8,427	$8,594
Home Economics Education	$5,794	$6,473	$7,439	$7,563	$9,558	$9,818
Accounting, Computing and Business Data Processing	$6,391	$7,237	$8,701	$9,108	$11,271	$11,656
General Office Clerical, Stenographic, Secretarial, and Related Occupations	$5,187	$5,786	$6,605	$6,863	$8,427	$8,594
Auto Mechanics	$8,585	$9,871	$12,299	$13,298	$16,379	$17,157
Carpentry	$8,578	$9,871	$12,299	$13,298	$16,379	$17,157
Electronics	$8,495	$9,804	$12,299	$13,298	$16,379	$17,157
Machine Shop	$8,538	$9,871	$12,299	$13,298	$16,379	$17,157
Cosmetology	$5,157	$5,786	$6,605	$6,863	$8,427	$8,594
Occupational Work Experience	$7,599	$8,726	$11,118	$11,799	$14,467	$15,125

Diagram IIB-11 shows for each of the Secondary Vocational programs the mean income of the vocational program graduates and the mean income of the comparable group during the six study years 1983, 1984, 1985, 1986, 1987 and 1988. In all of these years, the mean income of vocational graduates of each program exceeds that of the comparable group.

The change over time in mean income ratio of the vocational graduates to comparable groups can be examined in Table IIB-12. For all but one of the twelve programs, the ratio of the mean income was higher in 1988, 1987, 1986, 1985 and 1984, than in 1983, the first year of the study. The 1987 ratio of 1.33 compared to 1.35 in 1983 for Cosmetology provided the only exception.

Tables IIB-13, IIB-14, IIB-15, IIB-16, IIB-17 and IIB-18 which show the vocational program-equivalent group mean income ratios by region for 1983, 1984, 1985, 1986, 1987 and 1988 provide a basis for a similar examination of the behavior over time of vocational education income differential.

Finally, Diagram IIB-19 provides longitudinal curves for comparing the mean income of vocational graduates to the mean income of the equivalent group. For each program, two Lagrange interpolation polynomials were generated by substituting the data of the program into the Lagrange interpolation formula. The two curves in the diagram of each Secondary Vocational program are obtained by plotting the two Lagrange interpolation polynomials. The two curves trace the change in mean income over the 1983-1988 study period, and the evolution of the mean income of the vocational program graduate and that of the equivalent group.

DIAGRAM IIB-11

Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
1979 Secondary Vocational Graduates vs. Equivalent Groups

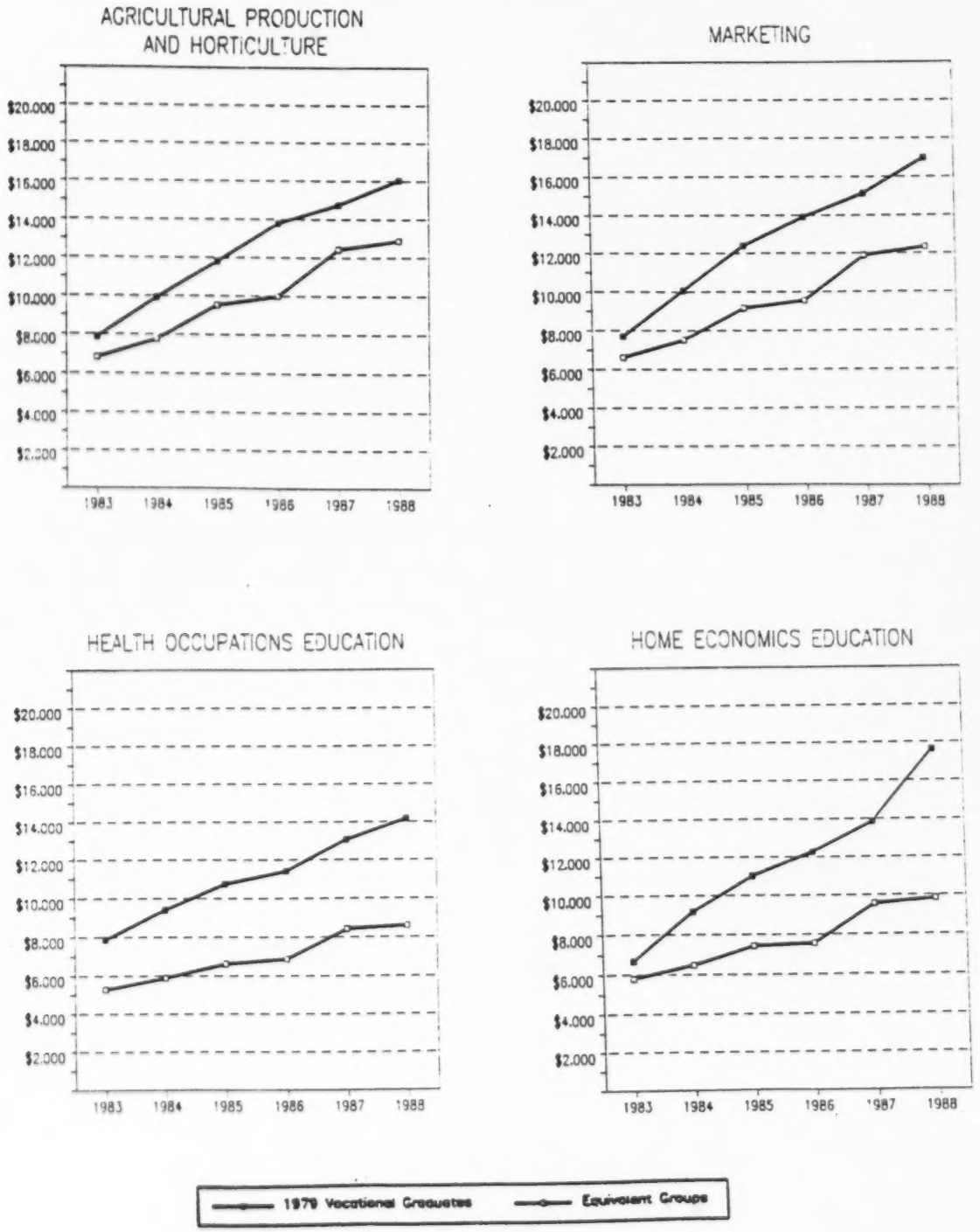
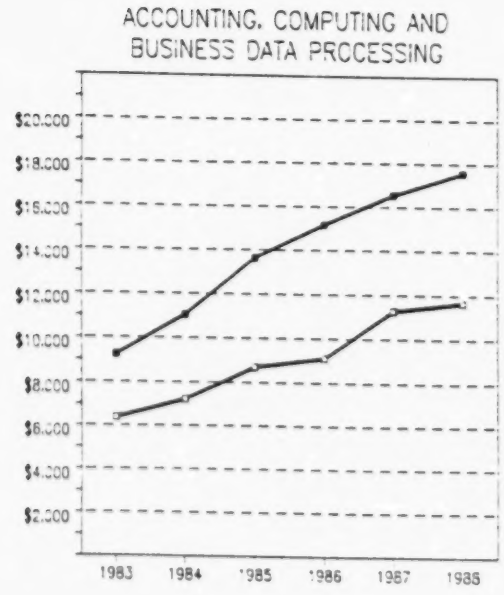
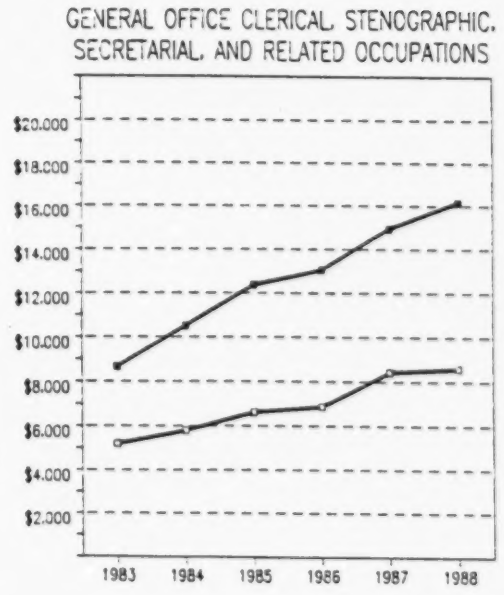
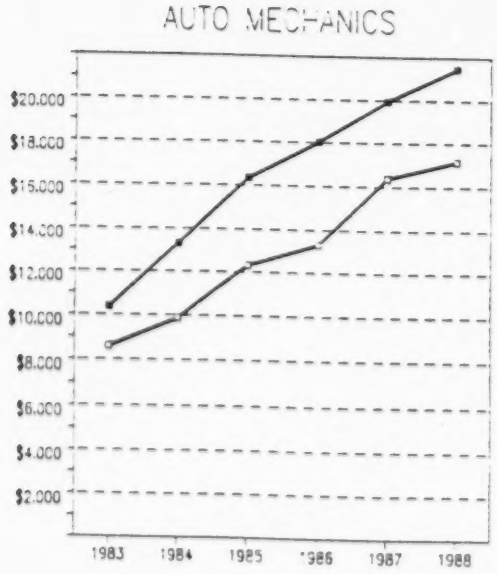


DIAGRAM IIB-11 (continued)

Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
1979 Secondary Vocational Graduates vs. Equivalent Groups







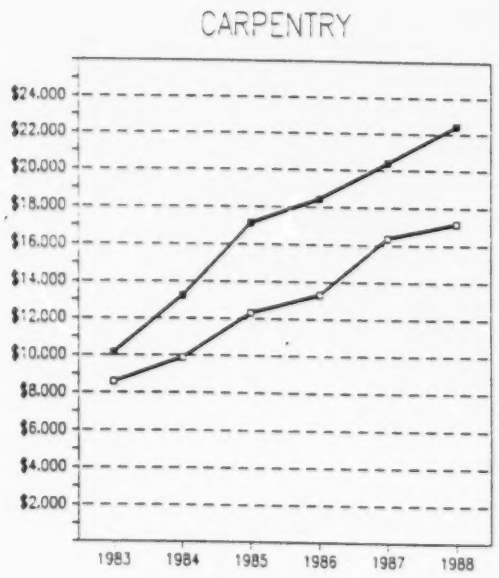


DIAGRAM IIB-11 (continued)

Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
1979 Secondary Vocational Graduates vs. Equivalent Groups

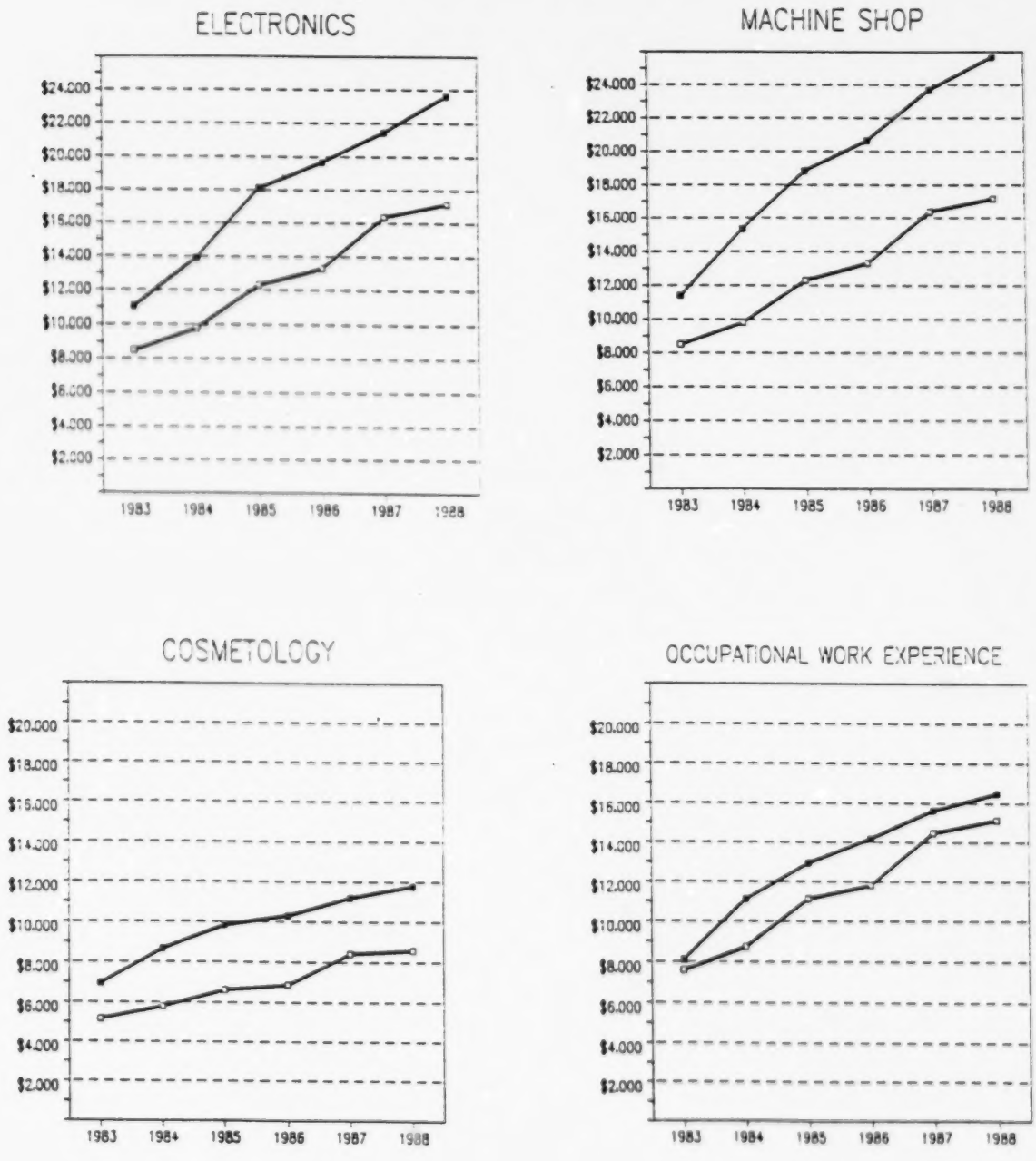


TABLE IIB-12

RATIOS OF MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM IN 1983, 1984, 1985, 1986, 1987 AND 1988

VOCATIONAL PROGRAM	1983	1984	1985	1986	1987	1988
Agricultural Production and Horticulture	1.16	1.28	1.24	1.38	1.19	1.25
Marketing	1.16	1.34	1.35	1.45	1.27	1.38
Health Occupations Education	1.49	1.60	1.63	1.66	1.55	1.65
Home Economics Education	1.15	1.42	1.48	1.62	1.45	1.79
Accounting, Computing and Business Data Processing	1.45	1.53	1.57	1.67	1.47	1.51
General Office Clerical, Stenographic, Secretarial, and Related Occupations	1.67	1.82	1.87	1.90	1.77	1.88
Auto Mechanics	1.21	1.35	1.33	1.35	1.22	1.25
Carpentry	1.18	1.34	1.39	1.38	1.24	1.31
Electronics	1.30	1.42	1.47	1.48	1.31	1.38
Machine Shop	1.33	1.56	1.53	1.55	1.45	1.50
Cosmetology	1.35	1.50	1.49	1.50	1.33	1.37
Occupational Work Experience	1.07	1.27	1.16	1.20	1.08	1.09

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TABLE IIB-13

RATIOS OF MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION (1983 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	1.16	1.39	1.19	1.23	0.93	1.41	1.11	1.38
2. Marketing	1.16	1.44	1.17	1.06	1.15	0.75	1.38	1.30
3. Health Occupations Education	1.49	1.67	1.54	1.27	1.54		1.85	1.74
4. Home Economics Education	1.15	1.38	1.17	1.07	1.15	1.57	0.94	1.32
5. Accounting, Computing and Business Data Processing	1.45	1.31	1.49	1.77	1.41	1.36	1.80	1.70
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	1.67	1.64	1.76	2.19	1.32	1.39	1.74	2.07
7. Auto Mechanics	1.21	1.15	1.28	1.07	1.15	1.46	1.26	1.46
8. Carpentry	1.18	1.56	1.14	1.33		0.87	1.13	1.32
9. Electronics	1.30	1.32	1.37	1.15	1.38	1.04	1.22	1.58
10. Machine Shop	1.33	1.34	1.40	0.84	1.35	1.64	1.47	1.60
11. Cosmetology	1.35	1.11	1.45	1.18	1.34		1.91	1.63
12. Occupational Work Experience	1.07	1.02	1.13	1.88	0.97	1.15	0.73	1.30

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TABLE IIB-14

RATIOS OF MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION (1984 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	1.28	1.21	1.34	1.30	1.48	1.37	1.35	1.48
2. Marketing	1.34	1.49	1.37	1.28	1.04	1.33	1.57	1.55
3. Health Occupations Education	1.60	1.43	1.71	1.88	1.54	1.68	1.57	1.93
4. Home Economics Education	1.42	1.52	1.47	1.35	1.77	1.61	1.18	1.64
5. Accounting, Computing and Business Data Processing	1.53	1.53	1.61	1.44	1.84	1.67	1.66	1.80
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	1.82	1.93	1.89	1.76	1.94	1.88	1.79	2.14
7. Auto Mechanics	1.35	1.27	1.43	1.39	1.63	1.59	1.39	1.59
8. Carpentry	1.34	1.22	1.41	1.36	1.08	2.15	1.51	1.58
9. Electronics	1.42	1.25	1.54	1.41	1.32	1.62	1.40	1.75
10. Machine Shop	1.56	1.34	1.68	1.56	1.64	1.56	1.44	1.94
11. Cosmetology	1.50	1.34	1.60	1.57	1.60	1.52	1.20	1.84
12. Occupational Work Experience	1.27	1.28	1.34	1.49	1.29	1.32	1.49	1.50

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TABLE IIB-15

RATIOS OF MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION (1985 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	1.24	1.20	1.31	1.43	1.22	1.11	1.25	1.59
2. Marketing	1.35	1.48	1.39	1.33	1.19	1.48	1.34	1.66
3. Health Occupations Education	1.63	1.57	1.72	1.78	1.60	1.66	1.76	2.04
4. Home Economics Education	1.48	1.55	1.54	1.54	1.83	1.52	1.54	1.78
5. Accounting, Computing and Business Data Processing	1.57	1.63	1.63	1.37	1.35	1.69	1.95	1.92
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	1.87	1.94	1.96	2.04	1.83	1.62	1.88	2.19
7. Auto Mechanics	1.33	1.27	1.41	1.28	1.78	1.73	1.27	1.65
8. Carpentry	1.39	1.33	1.48	1.31	1.46	1.82	1.37	1.75
9. Electronics	1.47	1.43	1.56	1.45	1.32	1.59	1.47	1.91
10. Machine Shop	1.53	1.51	1.62	1.57	1.62	1.56	1.24	1.90
11. Cosmetology	1.49	1.39	1.58	1.57	1.47	1.51	1.53	1.87
12. Occupational Work Experience	1.16	1.19	1.22	1.20	1.17	1.13	1.27	1.45

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TABLE IIB-16

RATIOS OF MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION (1986 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	1.38	1.25	1.48	1.38	1.44	1.63	1.26	1.56
2. Marketing	1.45	1.59	1.51	1.58	1.29	1.62	1.71	1.67
3. Health Occupations Education	1.66	1.55	1.78	1.93	1.83	1.83	1.66	2.06
4. Home Economics Education	1.62	2.04	1.60	1.46	2.14	1.82	1.31	1.85
5. Accounting, Computing and Business Data Processing	1.67	1.75	1.73	1.65	1.95	1.80	1.89	1.97
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	1.90	1.97	1.96	1.98	1.95	1.96	2.20	2.23
7. Auto Mechanics	1.35	1.26	1.45	1.39	1.41	1.57	1.35	1.67
8. Carpentry	1.38	1.28	1.48	1.46	1.24	1.88	1.48	1.68
9. Electronics	1.48	1.39	1.58	1.85	1.46	1.60	1.50	1.83
10. Machine Shop	1.55	1.44	1.69	1.65	1.63	1.72	1.54	1.97
11. Cosmetology	1.50	1.47	1.62	1.66	1.61	1.65	1.51	1.85
12. Occupational Work Experience	1.20	1.22	1.25	1.33	1.37	1.29	1.43	1.40

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TABLE IIB-17

RATIOS OF MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION (1987 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	1.19	1.24	1.18	1.18	1.16	1.13	1.05	1.30
2. Marketing	1.27	1.40	1.28	1.13	1.15	1.19	1.38	1.39
3. Health Occupations Education	1.55	1.47	1.56	1.48	1.53	1.49	1.45	1.67
4. Home Economics Education	1.45	1.74	1.38	1.38	1.47	1.31	1.08	1.52
5. Accounting, Computing and Business Data Processing	1.47	1.45	1.46	1.54	1.43	1.41	1.49	1.41
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	1.77	1.81	1.74	1.66	1.68	1.53	1.75	1.88
7. Auto Mechanics	1.22	1.04	1.24	1.24	1.08	1.41	1.29	1.32
8. Carpentry	1.24	1.15	1.26	1.20	1.12	1.29	1.09	1.35
9. Electronics	1.31	1.27	1.29	1.20	1.26	1.28	1.19	1.38
10. Machine Shop	1.45	1.39	1.45	1.38	1.42	1.41	1.23	1.55
11. Cosmetology	1.33	1.34	1.31	1.21	1.42	1.13	1.48	1.40
12. Occupational Work Experience	1.08	1.06	1.07	1.05	1.06	0.99	0.95	1.14

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TABLE IIB-18

RATIOS OF MEAN INCOME OF 1979 SECONDARY VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION (1988 TAX YEAR)

VOCATIONAL EDUCATION PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
1. Agricultural Production and Horticulture	1.25	1.28	1.24	1.25	1.22	1.29	1.08	1.31
2. Marketing	1.38	1.43	1.36	1.38	1.28	1.30	1.32	1.40
3. Health Occupations Education	1.65	1.68	1.63	1.70	1.66	1.54	1.51	1.73
4. Home Economics Education	1.79	1.81	1.76	1.71	1.78	1.74	1.80	1.83
5. Accounting, Computing and Business Data Processing	1.51	1.58	1.49	1.52	1.46	1.47	1.44	1.49
6. General Office Clerical, Stenographic, Secretarial, and Related Occupations	1.88	1.92	1.86	1.85	1.88	1.79	1.86	1.93
7. Auto Mechanics	1.25	1.21	1.26	1.25	1.24	1.36	1.28	1.29
8. Carpentry	1.31	1.34	1.30	1.28	1.39	1.22	1.27	1.38
9. Electronics	1.38	1.44	1.37	1.33	1.38	1.41	1.43	1.51
10. Machine Shop	1.50	1.47	1.50	1.54	1.52	1.49	1.58	1.66
11. Cosmetology	1.37	1.42	1.36	1.27	1.29	1.35	1.39	1.47
12. Occupational Work Experience	1.09	1.18	1.08	1.16	1.10	1.06	1.09	1.16

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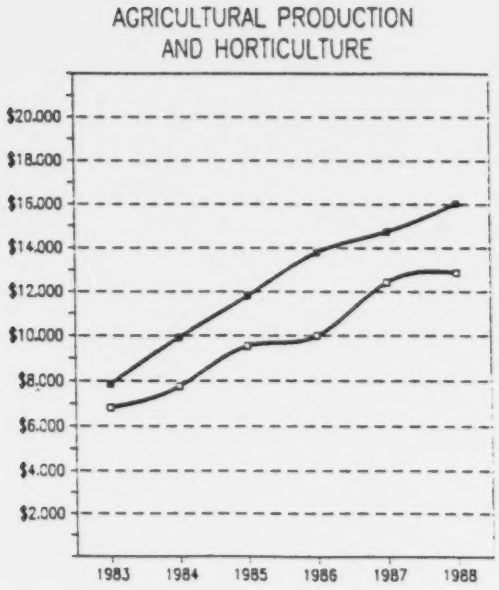
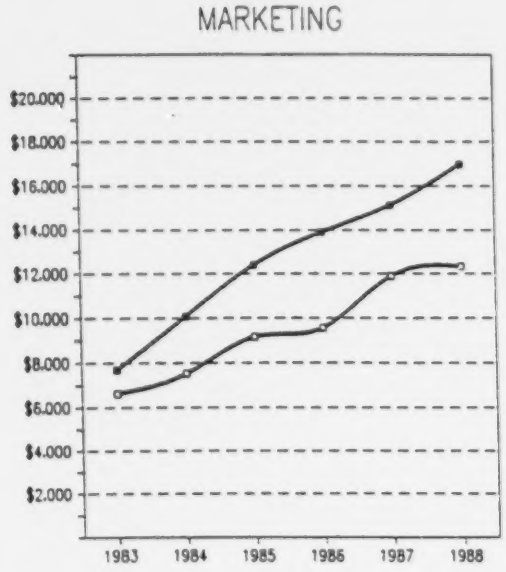
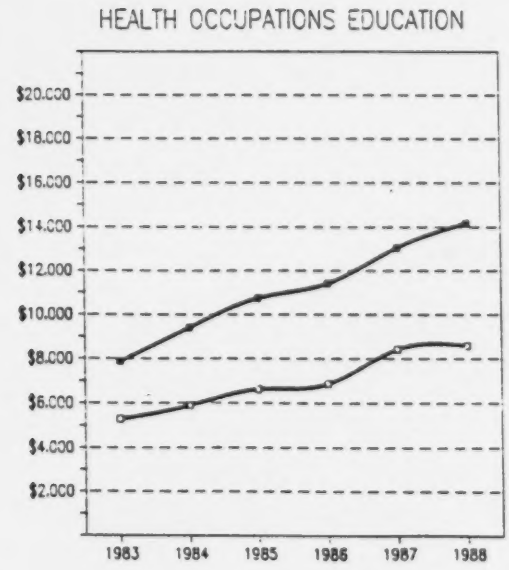
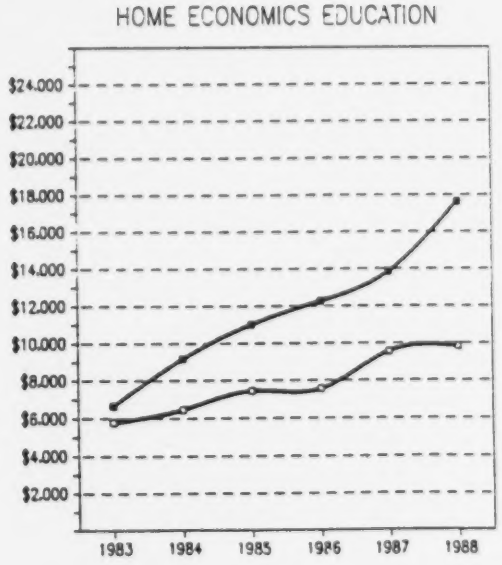
DIAGRAM IIB-19

Longitudinal Curves – Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
1979 Secondary Vocational Graduates vs. Equivalent Groups









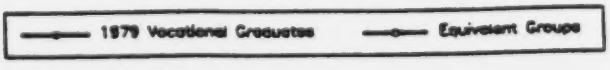


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DIAGRAM IIB-19 (continued)

Longitudinal Curves – Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
1979 Secondary Vocational Graduates vs. Equivalent Groups

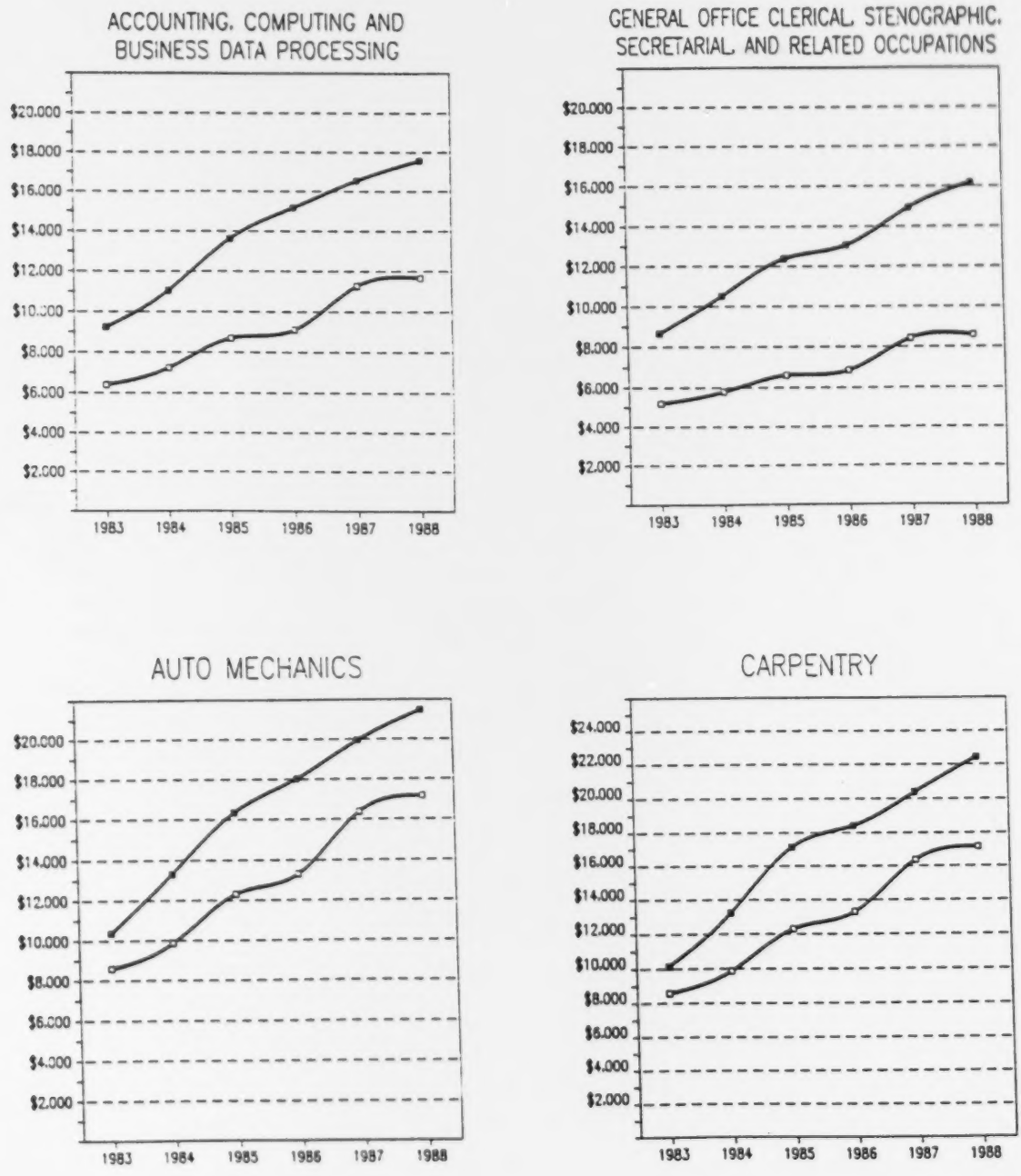
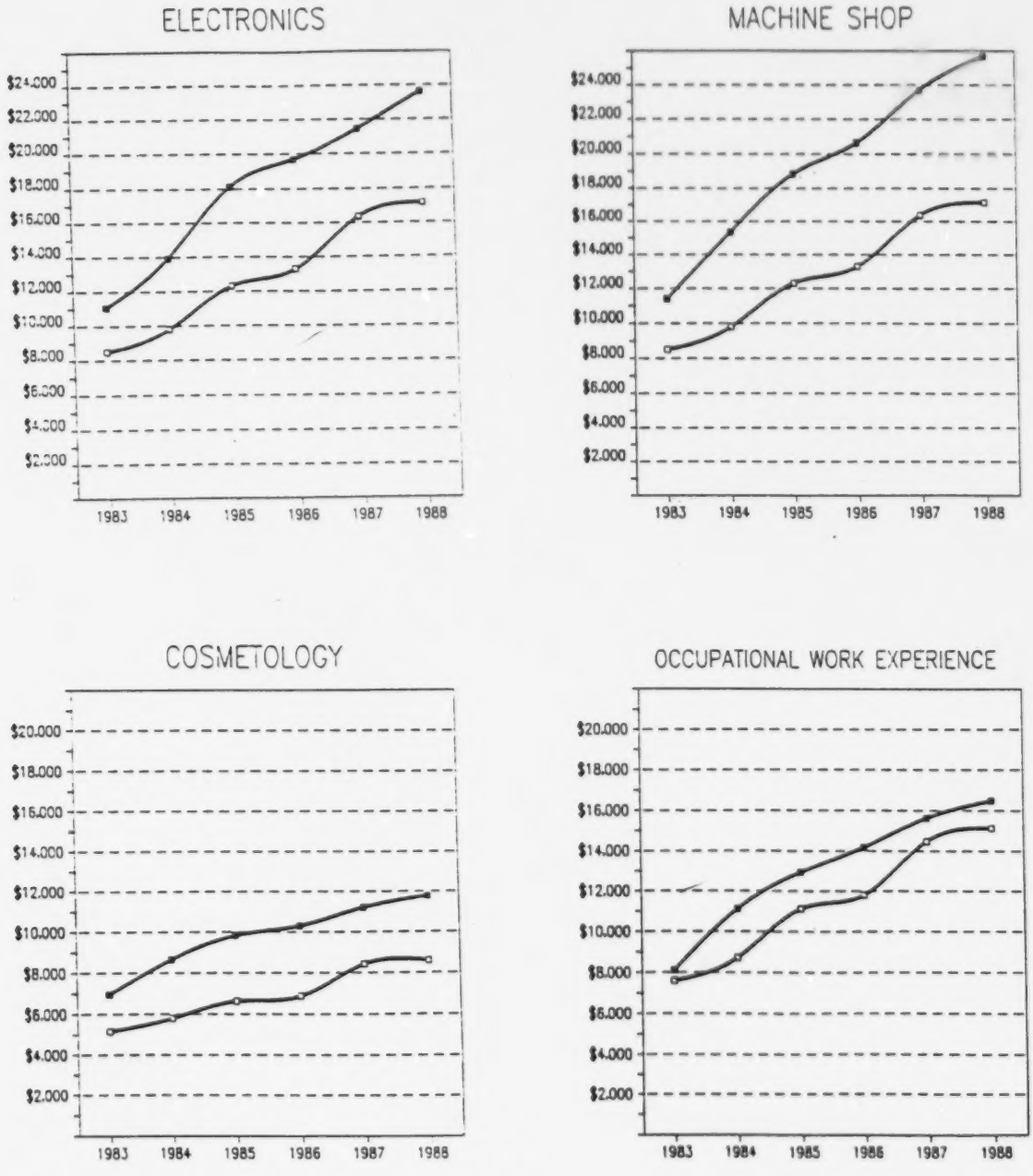


DIAGRAM IIB-19 (continued)

Longitudinal Curves — Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
1979 Secondary Vocational Graduates vs. Equivalent Groups



C. REGIONAL MOBILITY OF 1979 SECONDARY VOCATIONAL EDUCATION GRADUATES

The purpose of this section is to analyze the mobility patterns of vocational graduates by comparing their residence in 1988, 1987, 1986, 1985, 1984 and 1983 to that of 1979, the year in which they completed their programs.

Each vocational graduate was identified by the zip code of the school attended in 1979. Using the geographical regional classification of the State based on zip codes, we were able to determine for each vocational program the number of trainees who resided in each of the five regions of the State of Ohio (Central, Northeast, Northwest, Southwest and Balance of Ohio).

Geographic Mobility, 1979-1988

The group data on vocational graduates provided by the Internal Revenue Service for 1988 were classified by the same geographical regions within the State (as well as a sixth region: out-of-state) for each of the vocational programs. We were thus able to trace the mobility of the vocational graduates between 1979 and 1988.

For each of the vocational programs, a retention rate was calculated in each of the regions by comparing the region's percentage share in the total number of graduates in 1988 to that in 1979. To illustrate the calculation of the retention rate: if 2.41 percent of our sample of Marketing graduates were trained in Northwest Ohio in 1979 while 1.895 percent of the same group were identified as residents of Northwest Ohio in 1988, then the region's 1979-1988 retention rate of graduates of the Marketing program is estimated to be 78.63% (1.895 divided by 2.41).

Table IIC-1 provides the 1979-1988 retention rates by region for each of the twelve Secondary Vocational programs studied as well as for all of these programs combined. The retention rate of all twelve secondary programs for the State is estimated at 82.56%, indicating that approximately 17.44% of the 1979 graduates were out-of-state residents in 1988. The State's retention rate was estimated to be in the 80.13% to 86.05% range for all of the twelve programs.

TABLE IIC-1

RETENTION RATES OF SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION 1979-1988

VOCATIONAL PROGRAMS	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
All Programs	82.56%	73.84%	76.29%	54.08%	67.81%	88.73%
Agricultural Production and Horticulture	84.79%	37.33%	68.53%	49.00%	57.33%	129.67%
Marketing	81.14%	65.51%	70.41%	78.63%	78.63%	84.03%
Health Occupations Education	83.45%	57.10%	61.24%	48.25%	58.82%	97.16%
Home Economics Education	81.44%	80.82%	46.23%	59.86%	51.61%	94.06%
Accounting, Computing and Business Data Processing	80.13%	72.43%	83.06%	46.93%	56.17%	87.01%
General Office Clerical, Stenographic, Secretarial, and Related Occupations	83.86%	100.97%	80.37%	83.06%	76.81%	84.87%
Auto Mechanics	86.05%	69.72%	74.47%	16.38%	89.88%	87.27%
Carpentry	83.74%	69.01%		53.19%	77.74%	91.12%
Electronics	80.17%	67.96%	95.78%	21.43%	71.35%	85.00%
Machine Shop	85.01%	21.03%	79.42%	33.33%	94.37%	92.46%
Cosmetology	85.20%	41.12%	90.07%	28.07%	61.19%	94.23%
Occupational Work Experience	82.29%	52.53%	79.42%	47.31%	56.80%	88.57%

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A comparison of retention rates for the five Ohio regions shows the non-metropolitan part of Ohio (the Balance of Ohio region) as experiencing the highest retention rate of 88.73%, i.e. in 1988 its share of residents among all 1979 Secondary Vocational graduates was 88.73% of its share in 1979, an estimate indicating a decrease of 11.27% in its share; while Central Ohio, Northeast Ohio, Northwest Ohio and Southwest Ohio have 73.84%, 76.29%, 54.08% and 67.81%, respectively. In each case, the share decrease reflects the outmigration of graduates to other regions in Ohio as well as to out-of-state locations.

Geographic Mobility, 1979-1983, 1979-1984, 1979-1985, 1979-1986, 1979-1987, 1979-1988

The mobility patterns of the 1979 Secondary Vocational graduates can be analyzed by comparing their residence in 1983, 1984, 1985, 1986, 1987 and 1988 to that of 1979, the year in which they completed their programs.

The group data on vocational graduates provided by the Internal Revenue Service for 1983, 1984, 1985, 1986, 1987 and 1988 were classified by the same geographic regions within the State (as well as a sixth region: out-of-state) for each of the vocational programs. We were thus able to trace the mobility of vocational graduates between 1979 and 1983, 1979 and 1984, 1979 and 1985, 1979 and 1986, 1979 and 1987, and, 1979-1988.

For each of the vocational programs, a retention rate was calculated in each of the regions by comparing the percent share in the total number of trainees in 1983, 1984, 1985, 1986, 1987 and 1988 to that in 1979.

Table IIC-2 provides the retention rates of vocational graduates by region and vocational program for 1979-1983, 1979-1984, 1979-1985, 1979-1986, 1979-1987 and 1979-1988.

Retention rates are calculated on basis of residence. Therefore, retention by a region (or the State as a whole) included those who resided in the region (or the State as a whole) but worked out of the region or the State and did not include out-of-region (or out-of-state) residents whose work place was in the region (or the State as a whole).

TABLE IIC-2

RETENTION RATES OF 1979 SECONDARY VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION 1979-1983, 1979-1984, 1979-1985, 1979-1986, 1979-1987 AND 1979-1988

VOCATIONAL PROGRAMS	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
All Programs						
1979-1983	84.57%	77.44%	95.34%	68.02%	60.44%	87.21%
1979-1984	82.21%	75.54%	76.04%	63.95%	63.35%	87.77%
1979-1985	82.45%	74.08%	74.56%	52.99%	62.86%	89.11%
1979-1986	82.75%	74.47%	74.40%	53.92%	68.05%	88.67%
1979-1987	82.20%	70.36%	75.18%	53.81%	66.93%	88.39%
1979-1988	82.56%	73.84%	76.29%	54.08%	67.81%	88.73%
Agricultural Production and Horticulture						
1979-1983	90.08%	57.80%	92.13%	61.98%	52.96%	124.67%
1979-1984	83.00%	66.05%	76.17%	61.50%	51.19%	110.54%
1979-1985	83.61%	64.80%	72.47%	53.23%	53.47%	112.65%
1979-1986	83.94%	64.75%	69.18%	40.65%	54.21%	114.65%
1979-1987	84.47%	51.14%	60.76%	44.31%	51.14%	124.11%
1979-1988	84.79%	37.33%	68.53%	49.00%	57.33%	129.67%
Marketing						
1979-1983	83.33%	72.60%	83.56%	85.83%	65.99%	71.75%
1979-1984	80.46%	85.80%	75.23%	92.12%	65.85%	82.58%
1979-1985	80.28%	75.02%	73.64%	89.35%	67.71%	83.00%
1979-1986	80.51%	75.15%	76.15%	84.65%	70.46%	82.65%
1979-1987	79.44%	68.18%	72.19%	72.35%	72.35%	82.05%
1979-1988	81.14%	65.51%	70.41%	78.63%	78.63%	84.03%

VOCATIONAL PROGRAMS	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Health Occupations Education						
1979-1983	85.29%	83.89%	96.13%	24.93%	61.69%	90.24%
1979-1984	83.97%	71.14%	73.06%	58.51%	65.40%	92.67%
1979-1985	83.59%	69.55%	77.37%			103.35%
1979-1986	84.77%	71.80%	68.35%	48.74%	69.36%	94.32%
1979-1987	84.28%	65.75%	55.39%	38.69%	66.78%	98.23%
1979-1988	83.45%	57.10%	61.24%	48.25%	58.82%	97.16%
Home Economics Education						
1979-1983	84.41%	51.89%	89.35%	87.97%	52.50%	90.09%
1979-1984	81.05%	98.43%	64.09%	63.05%	59.02%	88.38%
1979-1985	81.86%	86.30%	65.29%	56.70%	54.07%	91.05%
1979-1986	81.42%	89.32%	61.31%	55.53%	53.37%	91.25%
1979-1987	81.36%	86.48%	48.77%	55.32%	56.60%	92.86%
1979-1988	81.44%	80.82%	46.23%	59.86%	51.61%	94.06%
Accounting, Computing and Business Data Processing						
1979-1983	88.54%	62.22%	102.27%	38.64%	40.84%	98.75%
1979-1984	80.75%	78.52%	76.28%	55.28%	62.45%	76.51%
1979-1985	81.51%	88.14%	69.69%	54.72%	65.69%	87.55%
1979-1986	81.47%	82.75%	73.47%	52.10%	65.05%	87.62%
1979-1987	80.98%	81.94%	74.42%	50.71%	52.54%	90.00%
1979-1988	80.13%	72.43%	83.06%	46.93%	56.17%	87.01%
General Office Clerical, Stenographic, Secretarial, and Related Occupations						
1979-1983	85.95%	81.26%	101.06%	108.49%	72.33%	84.54%
1979-1984	83.40%	91.10%	74.12%	93.32%	63.38%	87.74%
1979-1985	82.64%	93.27%	73.95%	115.40%	67.17%	85.88%
1979-1986	83.26%	89.32%	75.65%	64.13%	71.93%	85.74%
1979-1987	82.19%	91.49%	78.09%	78.02%	67.96%	85.16%
1979-1988	82.85%	100.97%	80.37%	83.06%	76.81%	84.87%

VOCATIONAL PROGRAMS	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Auto Mechanics						
1979-1983	88.14%	61.04%	160.91%	38.34%	89.34%	87.55%
1979-1984	84.07%	72.67%	105.07%	45.48%	87.14%	84.52%
1979-1985	84.26%	75.75%	101.36%	47.07%	89.74%	84.45%
1979-1986	84.44%	76.25%	103.55%	35.37%	84.83%	85.64%
1979-1987	86.52%	66.28%	77.57%	38.14%	95.47%	88.57%
1979-1988	86.05%	69.72%	74.47%	16.38%	89.88%	87.27%
Carpentry						
1979-1983						
1979-1984	85.61%	69.76%		63.85%	63.03%	92.28%
1979-1985	81.58%	64.79%		66.18%	66.37%	86.69%
1979-1986	82.39%	56.53%		53.02%	75.38%	88.58%
1979-1987	82.87%	62.64%		52.23%	78.70%	87.86%
1979-1988	82.37%	70.10%		50.86%	75.87%	88.73%
	83.74%	69.01%		53.19%	77.74%	91.12%
Electronics						
1979-1983	84.05%	62.96%	97.17%	55.59%	50.29%	94.13%
1979-1984	80.66%	74.48%	91.23%	48.94%	56.82%	87.31%
1979-1985	80.58%	68.75%	96.99%	44.72%	53.98%	87.97%
1979-1986	80.59%	72.70%	93.53%	43.74%	58.08%	87.49%
1979-1987	79.57%	75.91%	82.95%	25.32%	65.86%	87.16%
1979-1988	80.17%	67.96%	95.78%	21.43%	71.35%	85.00%
Machine Shop						
1979-1983	88.39%	35.85%	82.62%	55.15%	72.33%	96.89%
1979-1984	83.21%	40.93%	81.81%	64.82%	84.51%	87.63%
1979-1985	85.06%	40.09%	78.34%	45.34%	90.36%	91.04%
1979-1986	85.47%	39.26%	78.53%	44.41%	95.25%	91.18%
1979-1987	84.46%	35.31%	73.59%	26.77%	92.96%	91.87%
1979-1988	85.01%	21.03%	79.42%	33.33%	94.37%	92.46%

VOCATIONAL PROGRAMS	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Cosmetology						
1979-1983	87.30%	51.25%	92.10%	28.57%	56.07%	97.61%
1979-1984	84.72%	53.45%	82.09%	43.42%	68.93%	92.61%
1979-1985	84.25%	53.11%	83.78%	37.43%	70.29%	91.80%
1979-1986	84.31%	51.59%	88.80%	44.75%	70.73%	90.21%
1979-1987	84.48%	12.58%	89.39%	48.29%	54.78%	97.77%
1979-1988	85.20%	41.12%	90.07%	48.07%	61.19%	94.23%
Occupational Work Experience						
1979-1983	85.04%	44.28%	93.06%	84.86%	38.19%	88.68%
1979-1984	82.26%	76.58%	76.59%	90.29%	44.18%	84.56%
1979-1985	81.75%	68.97%	72.89%	78.39%	51.79%	86.20%
1979-1986	82.73%	68.50%	69.50%	65.40%	56.74%	88.47%
1979-1987	82.52%	50.00%	73.59%	42.65%	28.88%	91.63%
1979-1988	82.29%	52.53%	79.42%	47.31%	56.80%	88.57%

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data
by I.A. Ghazalah, Ohio University

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CHAPTER III

THE 1979 ASSOCIATE VOCATIONAL EDUCATION GRADUATES

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THE 1979 ASSOCIATE VOCATIONAL EDUCATION GRADUATES

The study included 1,946 graduates in 1979 of two Associate Vocational programs in Ohio. In this chapter, we will report on and analyze the earnings of the 1979 Associate Vocational graduates in 1988, nine years following their graduation. The earnings and geographic mobility in 1988 of the 1979 Associate Vocational graduates will be compared with their performance in 1987, 1986, 1985, 1984 and 1983.

Table III-A lists the Associate Vocational programs included in the study, the number of graduates and the percentage of females and males in each program. Diagram III-B is a bar chart of the number of completers in each of the study's two Associate Vocational programs. Diagram III-C shows the percentage of females and males in each of the study programs. Table III-D presents the distribution of the 1979 Associate Vocational education graduates by vocational program and training region. Diagram III-E shows the geographic distribution of graduates of the Associate Vocational programs included in the study.

TABLE III-A

STUDY OF 1979 ASSOCIATE VOCATIONAL EDUCATION GRADUATES BY PROGRAM AND GENDER

VOCATIONAL PROGRAM	NUMBER OF GRADUATES	PERCENTAGE FEMALES	PERCENTAGE MALES
Health Occupations Education	989	91.51%	8.49%
Technical Education	957	11.29%	88.71%
TOTAL	1,946	52.62%	47.38%

DIAGRAM III-B
Study of 1979 Associate Vocational Graduates
Number of Completers by Program

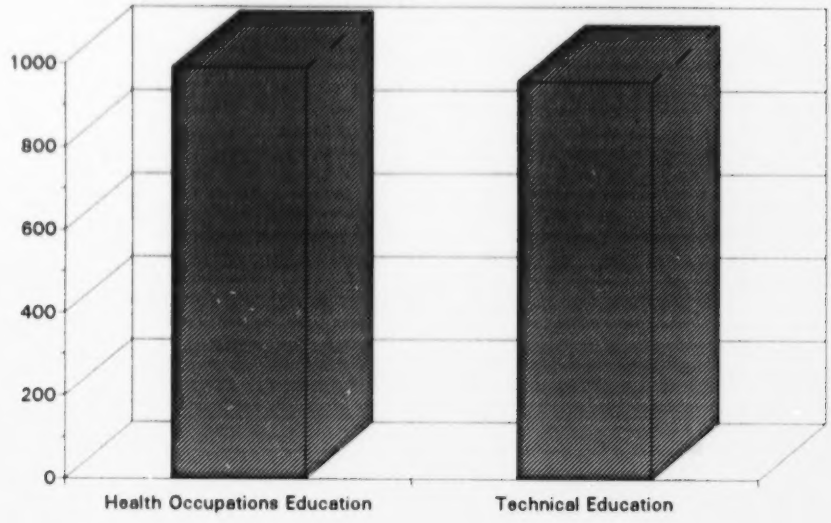


DIAGRAM III-C
Study of 1979 Associate Vocational Graduates
Percentage of Females and Males by Program

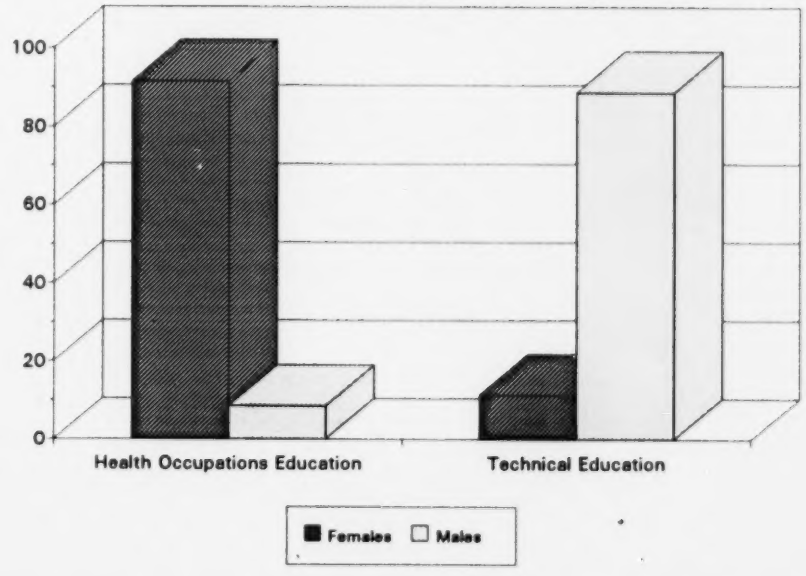


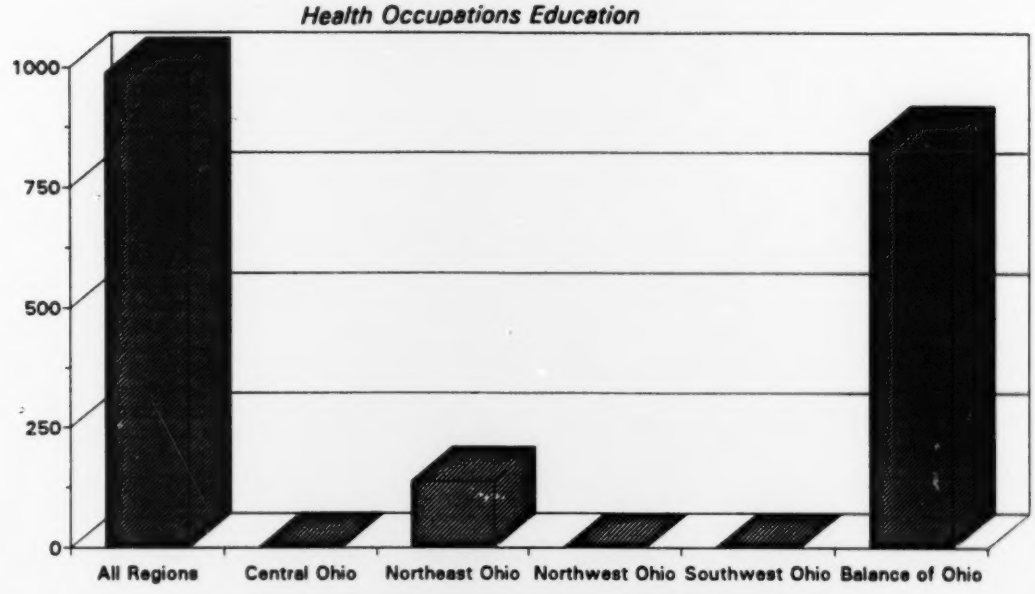
TABLE III-D

STUDY OF 1979 ASSOCIATE VOCATIONAL GRADUATES
DISTRIBUTION BY VOCATIONAL PROGRAM AND GEOGRAPHICAL REGION

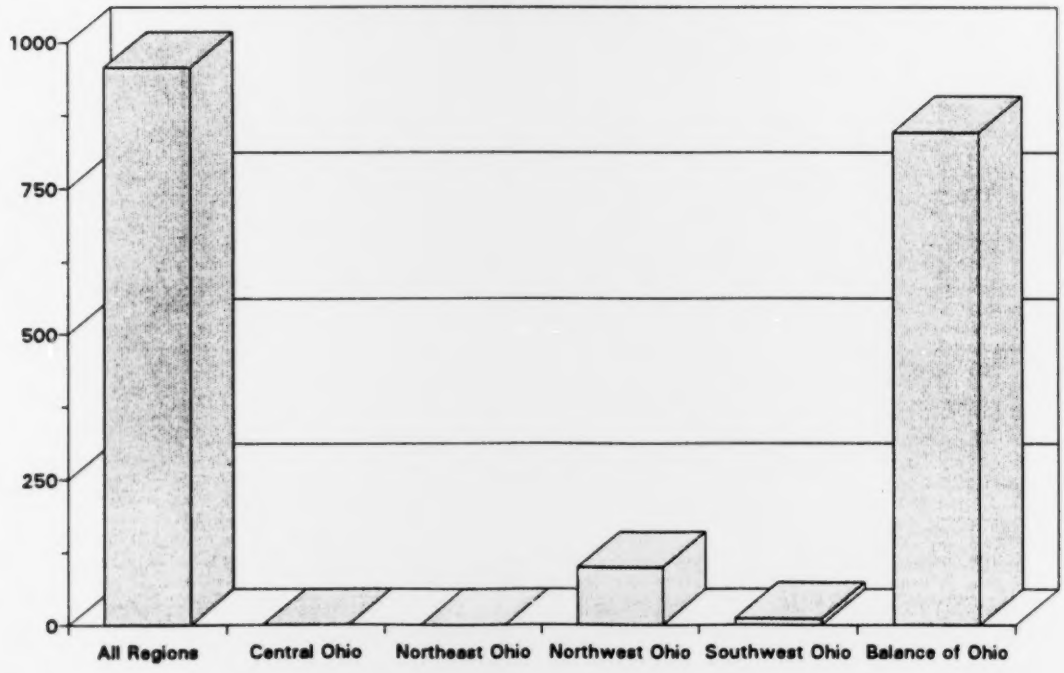
VOCATIONAL PROGRAMS	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO	ALL REGIONS
Health Occupations Education	1	139			849	989
Technical Education			99	12	846	957
TOTAL	1	139	99	12	1,695	1,946

DIAGRAM III-E
Study of 1979 Associate Vocational Graduates
Distribution by Geograpical Region

Health Occupations Education



Technical Education



A. INCOME OF 1979 ASSOCIATE VOCATIONAL GRADUATES: 1988 INCOME TABULATIONS

The data provided by Internal Revenue Service were used to determine the economic performance of the 1979 Associate Vocational graduates nine years following their graduation.

Tables IIIA-1 and IIIA-2 present data on the 1988 Tax Year reported income of the 1979 Associate Vocational graduates for each of the two programs. Reported income is the sum of wages and salaries, income from interest and dividends, and other income (miscellaneous income from work provided by other than as employees) as reported to the Internal Revenue Service.

Table IIIA-2, for example, provides the reported income data of those who completed the Technical Education program. For the entire group of completers, the mean reported income in 1988 was $35,828. Among the group, reported income varied as follows: 3.27% received less than $5,500 (a mean of $4,315); 2.44% between $7,000 and $9,999 (a mean of $8,493); 2.79% between $10,000 and $12,999 (a mean of $12,382); 1.51% between $13,000 and $14,499 (a mean of $14,379); 1.63% between $14,500 and $15,999 (a mean of $15,991); 1.86% between $16,000 and $18,999 (a mean of $18,534); 5.47% between $19,000 and $21,999 (a mean of $21,915); 6.52% between $22,000 and $23,999 (a mean of $23,872); and 74.51% had a reported income of at least $24,000 with a mean of $42,352.

The table also shows the distribution of reported income for those among the 1979 Technical Education program completers who resided outside the State of Ohio in 1988 as compared to those who resided in the state (a mean income of $39,027 and $34,582 respectively). The reported incomes of the Ohio residents are then shown by the region of their residence (Central Ohio, Northeast Ohio, Northwest Ohio, Southwest Ohio and Balance of Ohio).

A tabulation of mean reported income by program and region is given in Table IIIA-3. Diagram IIIA-A is a bar graph of mean reported incomes of completers of each of the Associate Vocational programs studied.

TABLE IIIA-1
HEALTH OCCUPATIONS EDUCATION
1979 ASSOCIATE VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	7.84% $4,213	12.66% $3,134	6.80% $4,808			6.76% $4,780		
$5,500-6,999							9.37% $4,694	7.74% $6,176
$7,000-8,499	2.58 7,840	5.33 8,125	1.99 7,536			4.49 8,385		3.88 8,270
$8,500-9,999	1.64 9,595							
$10,000-11,499	2.46 10,969		4.55 10,161			4.49 11,881		4.40 11,725
$11,500-12,999	3.75 12,430	6.00 12,583	3.69 12,773					
$13,000-14,499	3.28 14,434	2.67 15,063	3.41 14,330	100% $31,226	100% $31,156	4.49 14,902		3.62 14,140
$14,500-15,999	3.28 15,240		3.41 15,710					3.88 15,407
$16,000-18,999	14.52 21,122	16.00 19,535	14.78 20,181			6.74 19,769	15.63 20,853	5.68 17,855
$19,000-21,999								26.61 23,385
$22,000-23,999	9.60 23,437	10.67 23,415	9.38 23,556			73.03 33,644	75.00 35,096	
$24,000 and over	51.05 34,527	46.67 37,188	51.99 34,232					44.19 34,567
TOTAL	100% $25,342	100% $24,966	100% $25,425	100% $31,226	100% $31,156	100% $27,805	100% $30,021	100% $24,936

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TABLE IIIA-2
TECHNICAL EDUCATION
1979 ASSOCIATE VOCATIONAL COMPLETERS
REPORTED INCOME
(1988 TAX YEAR)

Size of Reported Income	All Regions Percent/Mean	Outside Ohio Percent/Ohio	All Ohio Percent/Mean	Central Ohio Percent/Mean	Northeast Ohio Percent/Mean	Northwest Ohio Percent/Mean	Southwest Ohio Percent/Mean	Balance of Ohio Percent/Mean
Under $5,500	3.27% $4,315	3.34% $3,236	3.24% $4,146	7.40% $3,820	14.29% $4,065	8.89% $3,527	10.34% $3,691	2.58% $5,373
$5,500-6,999								
$7,000-8,499	2.44 8,493	2.91 8,521	2.26 8,639					2.58 7,977
$8,500-9,999								
$10,000-11,499			1.29 11,327					2.11 11,212
$11,500-12,999	2.79 12,382	5.80 12,996	1.13 12,155					
$13,000-14,499	1.51 14,379		1.29 13,916					1.87 14,491
$14,500-15,999	1.63 15,991							
$16,000-18,999	1.86 18,534	2.90 17,639	2.27 16,652					2.11 15,991
$19,000-21,999	5.47 21,915		6.80 21,105	17.41 21,350			20.69 21,703	
$22,000-23,999	6.52 23,872	9.54 22,196	7.61 23,804		25.00 22,884			7.49 22,550
$24,000 and over	74.51 42,352	75.51 46,734	74.11 40,689	75.19 46,541	60.71 40,615	91.11 39,708	68.97 37,515	81.26 38,566
TOTAL	100% $35,828	100% $39,027	100% $34,582	100% $38,994	100% $30,959	100% $36,491	100% $30,746	100% $34,209

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data
by I.A. Ghazalah, Ohio University

TABLE IIIA-3

MEAN INCOME OF 1979 ASSOCIATE VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1988 TAX YEAR)

VOCATIONAL PROGRAM	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Health Occupations Education	$25,342	$24,966	$25,425	$31,226	$31,156	$27,805	$30,021	$24,936
Technical Education	$35,828	$39,027	$34,582	$38,994	$30,959	$36,491	$30,746	$34,209

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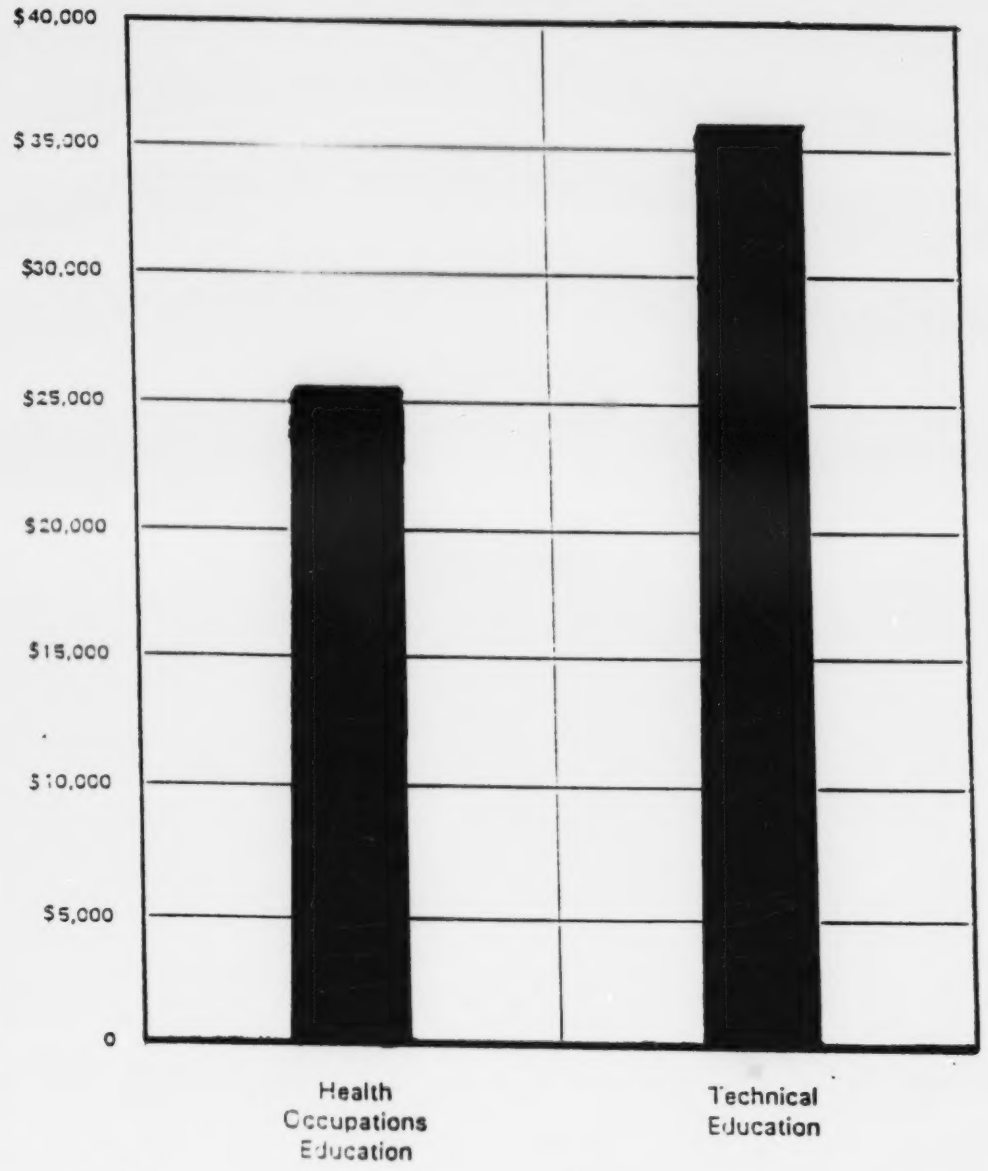
DIAGRAM IIIA-A
1988 Mean Income of 1979 Associate Vocational Graduates By Vocational Program



B. INCOME OF THE 1979 ASSOCIATE VOCATIONAL EDUCATION GRADUATES; COMPARISON WITH EQUIVALENT GROUPS

The data provided by the Internal Revenue Service were used to determine the economic performance of the 1979 graduates of the Associate Vocational programs in 1983, 1984, 1985, 1986, 1987 and 1988, four, five, six, seven, eight and nine years following their graduation.

Tables IIIB-1 shows the 1988 mean income by program and region of the 1979 Associate Vocational graduates. Table IIIB-2 provides the same data for 1983, 1984, 1985, 1986, 1987 and 1988. Table IIIB-3 shows the mean income of the 1979 Associate Vocational graduates by vocational program in 1983, 1984, 1985, 1986, 1987 and 1988.

Income data on the 1979 graduates of Associate Vocational programs for the 1983, 1984, 1985, 1986, 1987 and 1988 tax years may be analyzed using baseline data on a comparable group, i.e. one with a comparable age, educational achievement and gender composition.

The comparable educational achievement used was completion of 1-3 years of college. The age and gender factors in income comparison were determined allowing for the characteristics of a longitudinal study.

Gender Composition

The longitudinal study of the 1979 vocational graduates began in 1983. For that year, the Internal Revenue Service data (which do not include gender breakdown) were provided on 99.13% of the study population. With the decline in this percentage in subsequent years, adjustments for changes in the gender ratio of provided data became necessary for appropriate calculations of the relative incomes.

The gender composition change was estimated as follows:

(i) Single-gender dominated Secondary Vocational programs were utilized to estimate gender composition over time for each of the programs.

(ii) Single-gender dominated Secondary Vocational programs were identified: Health Occupations Education; General Office Clerical, Stenographic, Secretarial and Related Occupations; and Cosmetology (with a female percentage of 95.33, 98.10 and 98.94, respectively) were identified as female-dominated. Auto Mechanics, Carpentry, Electronics and Machine Shop with 99.10%, 99.80%, 97.40% and 98.54% male, respectively, were identified as male-dominated programs.

TABLE IIIB-1

MEAN INCOME OF 1979 ASSOCIATE VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1988 TAX YEAR)

VOCATIONAL PROGRAMS	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Health Occupations Education	$25,342	$24,966	$25,425	$31,226	$31,156	$27,805	$30,021	$24,936
Technical Education	$35,828	$39,027	$34,582	$38,994	$30,959	$36,491	$30,746	$34,209

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TABLE IIIB-2

MEAN INCOME OF 1979 ASSOCIATE VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION 1988, 1987, 1986, 1985, 1984 AND 1983

VOCATIONAL PROGRAMS	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Health Occupations Education								
1988	$25,342	$24,966	$25,425	$31,226	$31,156	$27,805	$30,021	$24,936
1987	$23,882	$25,708	$23,388	$25,084	$24,931	$24,392	$24,735	$22,825
1986	$21,020	$22,554	$20,910	$22,842	$23,629	$23,147	$23,789	$19,869
1985	$19,392	$19,430	$19,382		$20,243	$19,884	$17,445	$20,335
1984	$16,199	$16,279	$16,355	$15,123	$17,420	$15,367	$15,447	$16,592
1983	$17,094	$17,799	$16,957	$15,363	$16,851	$18,514	$16,768	$16,956
Technical Education								
1988	$35,828	$39,027	$34,582	$38,994	$30,959	$36,491	$30,746	$34,209
1987	$33,624	$37,499	$32,131	$37,601	$33,475	$34,014	$35,142	$31,962
1986	$29,118	$30,890	$28,940	$32,389	$27,633	$32,185	$29,488	$28,250
1985	$27,230	$29,153	$26,482	$24,848	$23,840	$29,113	$27,744	$26,575
1984	$22,460	$23,764	$21,932	$22,557	$22,334	$24,424	$22,311	$21,429
1983	$18,889	$21,988	$17,893	$19,797	$16,741	$17,906	$17,447	$17,692

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TABLE IIIB-3

MEAN INCOME IN 1983, 1984, 1985, 1986, 1987 AND 1988 BY VOCATIONAL PROGRAM
1979 Associate Vocational Graduates

VOCATIONAL PROGRAM	Mean Income in 1983	Mean Income in 1984	Mean Income in 1985	Mean Income in 1986	Mean Income in 1987	Mean Income in 1988
Health Occupations Education	$17,094	$16,199	$19,392	$21,020	$23,882	$25,342
Technical Education	$18,889	$22,460	$27,230	$29,118	$33,624	$35,828

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data by I.A. Ghazalah, Ohio University

(iii) The percentage sample loss by program between 1979 and each of the study years 1983, 1984, 1985, 1986, 1987 and 1988 from the female and male-dominated programs were used to calculate a weighted percentage loss of females and males. This weighted percentage loss was then used to adjust the original 1979 gender breakdown. Table IIIB-4 shows the adjusted gender breakdown for 1988, 1987, 1986, 1985, 1984 and 1983 as well as the original gender breakdown at time of graduation in 1979.

Age

Incomes of the 1988 Associate Vocational graduates were analyzed by comparison to income data on age-specific (34-year-old) with 1-3 years of college educational education in the United States for 1988. Incomes of the comparable group were generated using the machine-readable data file Current Population Survey, March 1989 conducted by the Bureau of the Census for the Bureau of Labor Statistics: Current Population Survey, March 1989 Tape Technical Documentation and prepared by Data User Services Division, Data Access and Use Staff, Bureau of the Census, Washington: The Bureau: 1989.

The age-specific Bureau of the Census income-data for completers of 1-3 years of college, and the adjusted gender composition were used to calculate the U.S. basic comparison figure for each of the Associate Vocational programs. For example, the 1988 U.S. comparison figure of $14,060 for graduates of Health Occupations Education was calculated by multiplying .9391 (the proportion of females) times $13,260 (the female earnings figure) and adding the result to that of multiplying .0609 (the proportion of males) times $26,407 (the male earnings figure).

Table IIIB-5 shows the 1988 mean income of the comparable group (the same age, gender composition and educational achievement) for each of the two Associate Vocational programs.

Next, in order to carry out the comparison over time between incomes of graduates of vocational programs in the study and those of the comparable group in the general population, we utilized the same procedure described for 1987, 1986, 1985, 1984 and 1983. Table IIIB-6 shows the mean income of the comparable group (the same age, gender composition and educational achievement) for each of the Associate Vocational programs for each of the study years 1983, 1984, 1985, 1986, 1987 and 1988 (four, five, six, seven, eight and nine years following graduation).

TABLE IIIB-4

1979 ASSOCIATE VOCATIONAL GRADUATES: ADJUSTED GENDER COMPOSITION (1988, 1987, 1986, 1985, 1984, 1983) AND GENDER COMPOSITION IN 1979 BY PROGRAM

	Adjusted Gender Composition												Gender Composition of 1979 Graduates	
	1988		1987		1986		1985		1984		1983			
VOCATIONAL PROGRAM	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males
Health Occupations Education	93.91%	6.09%	94.34%	5.66%	94.66%	5.34%	95.08%	4.92%	93.47%	6.53%	91.51%	8.49%	91.51%	8.49%
Technical Education	1.38%	98.62%	8.07%	91.93%	9.63%	90.37%	8.38%	91.62%	9.46%	90.54%	11.29%	88.71%	11.29%	88.71%

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TABLE IIIB-5

1988 MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM

VOCATIONAL PROGRAM	Mean Income of Equivalent Group 1988
Health Occupations Education	$14,060
Technical Education	$26,226

TABLE IIIB-6

MEAN INCOME IN 1983, 1984, 1985, 1986, 1987 AND 1988 OF EQUIVALENT GROUPS

VOCATIONAL PROGRAM	Mean Income in 1983	Mean Income in 1984	Mean Income in 1985	Mean Income in 1986	Mean Income in 1987	Mean Income in 1988
Health Occupations Education	$10,174	$10,585	$11,856	$12,183	$13,780	$14,060
Technical Education	$16,232	$20,028	$23,599	$23,768	$25,313	$26,226

Diagram IIIB-7 shows for each of the Associate Vocational programs the mean income of the vocational program graduates and the mean income of the comparable group during the six study years 1983, 1984, 1985, 1986, 1987 and 1988. In all of these years, the mean income of vocational graduates of each program exceeds that of the comparable group.

The change over time in mean income ratio of the vocational graduates to comparable groups can be examined in Table IIIB-8. In both of the Associate Vocational programs, the ratio in 1988 was higher than in 1987 (1.80 compared to 1.73 for Health Occupations Education and 1.37 vs. 1.33 in Technical Education). For both of the Associate programs, the ratio of the mean income was higher in 1988, the fifth year of the study, than in 1983 (1.80 compared to 1.68 for Health Occupations Education and 1.37 vs. 1.16 for Technical Education). For both programs the ratio of the mean income was lower in 1985 and 1984, the third and second year of the study, than in 1983 (1.64 in 1985 and 1.53 in 1984 compared to 1.68 in 1983 for Health Occupations Education and 1.15 in 1985 and 1.12 in 1984 vs. 1.16 in 1983 for Technical Education).

Table IIIB-9 shows the vocational program-equivalent group mean income ratios by region for 1988. Table IIIB-10 with the ratios for 1983, 1984, 1985, 1986, 1987 and 1988, provides a basis for a similar examination of the behavior over time of vocational education income differential.

Finally, Diagram IIIB-11 provides longitudinal curves for comparing the mean income of vocational graduates to the mean income of the equivalent group. For each program, two Lagrange interpolation polynomials were generated by substituting the data of the program into the Lagrange interpolation formula. The two curves in the diagram of each Associate Vocational program are obtained by plotting the two Lagrange interpolation polynomials. The two curves trace the change in mean income over the 1983-1988 study period, and the evolution of the mean income of the vocational program graduate and that of the equivalent group.

DIAGRAM IIIB-7

Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
Associate Vocational Graduates vs. Equivalent Group

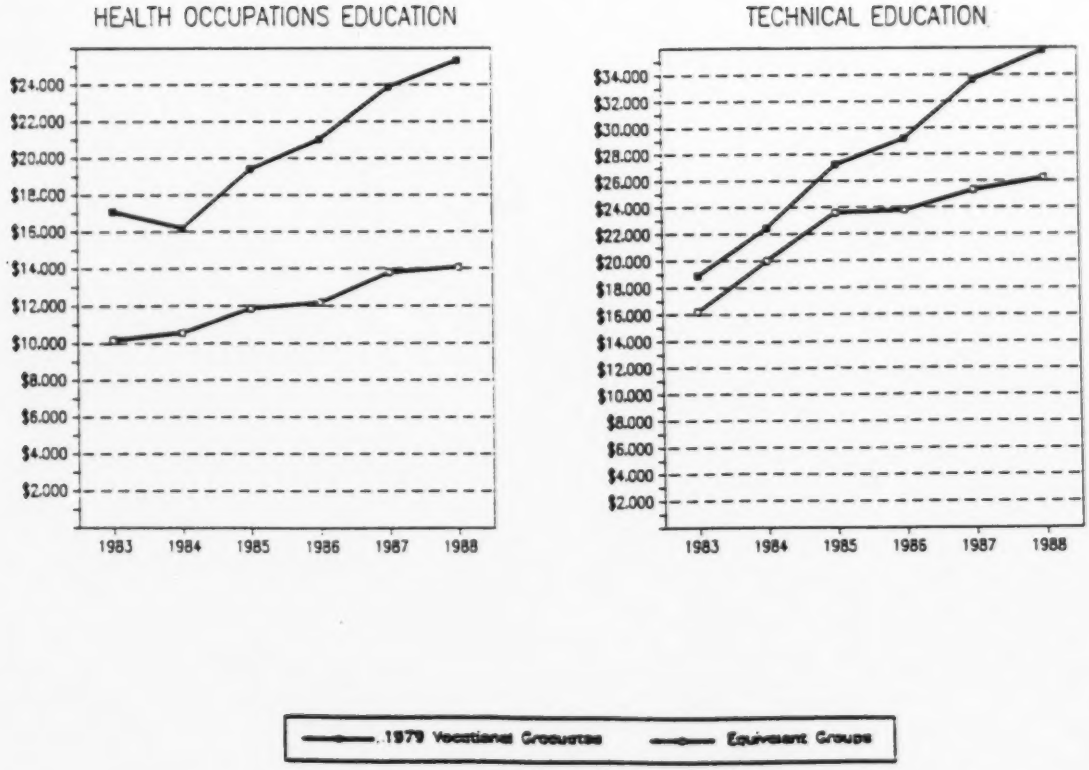

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TABLE IIIB-8

RATIOS OF MEAN INCOME OF 1979 ASSOCIATE VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM IN 1983, 1984, 1985, 1986, 1987 AND 1988

VOCATIONAL PROGRAM	1983	1984	1985	1986	1987	1988
Health Occupations Education	1.68	1.53	1.64	1.73	1.73	1.80
Technical Education	1.16	1.12	1.15	1.23	1.33	1.37

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TABLE IIIB-9

RATIOS OF MEAN INCOME OF 1979 ASSOCIATE VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION (1988 TAX YEAR)

VOCATIONAL PROGRAMS	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Health Occupations Education	1.80	1.79	1.81	1.83	1.82	1.76	1.79	1.85
Technical Education	1.37	1.41	1.36	1.43	1.29	1.39	1.32	1.43

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TABLE IIIB-10

RATIOS OF MEAN INCOME OF 1979 ASSOCIATE VOCATIONAL GRADUATES TO MEAN INCOME OF EQUIVALENT GROUP BY VOCATIONAL PROGRAM AND REGION 1988, 1987, 1986, 1985, 1984 AND 1983

VOCATIONAL PROGRAMS	ALL REGIONS	OUTSIDE OHIO	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Health Occupations Education								
1988	1.80	1.79	1.81	1.83	1.82	1.76	1.79	1.85
1987	1.73	1.78	1.74	1.73	1.76	1.75	1.68	1.82
1986	1.73	1.85	1.81	1.43	1.65	1.51	1.45	1.88
1985	1.64	1.64	1.72	1.51	1.66	1.90	1.64	1.99
1984	1.53	1.54	1.63	1.88	1.96	2.06	1.92	2.02
1983	1.68	1.75	1.51		1.73	1.77	1.45	2.18
Technical Education								
1988	1.37	1.41	1.36	1.43	1.29	1.39	1.32	1.43
1987	1.33	1.44	1.28	1.41	1.28	1.33	1.30	1.39
1986	1.23	1.30	1.28	1.37	1.18	1.47	1.22	1.47
1985	1.15	1.24	1.18	1.06	1.02	1.30	1.16	1.43
1984	1.12	1.19	1.15	1.13	1.12	1.27	1.11	1.28
1983	1.16	1.34	1.16	1.22	1.03	1.15	1.07	1.30

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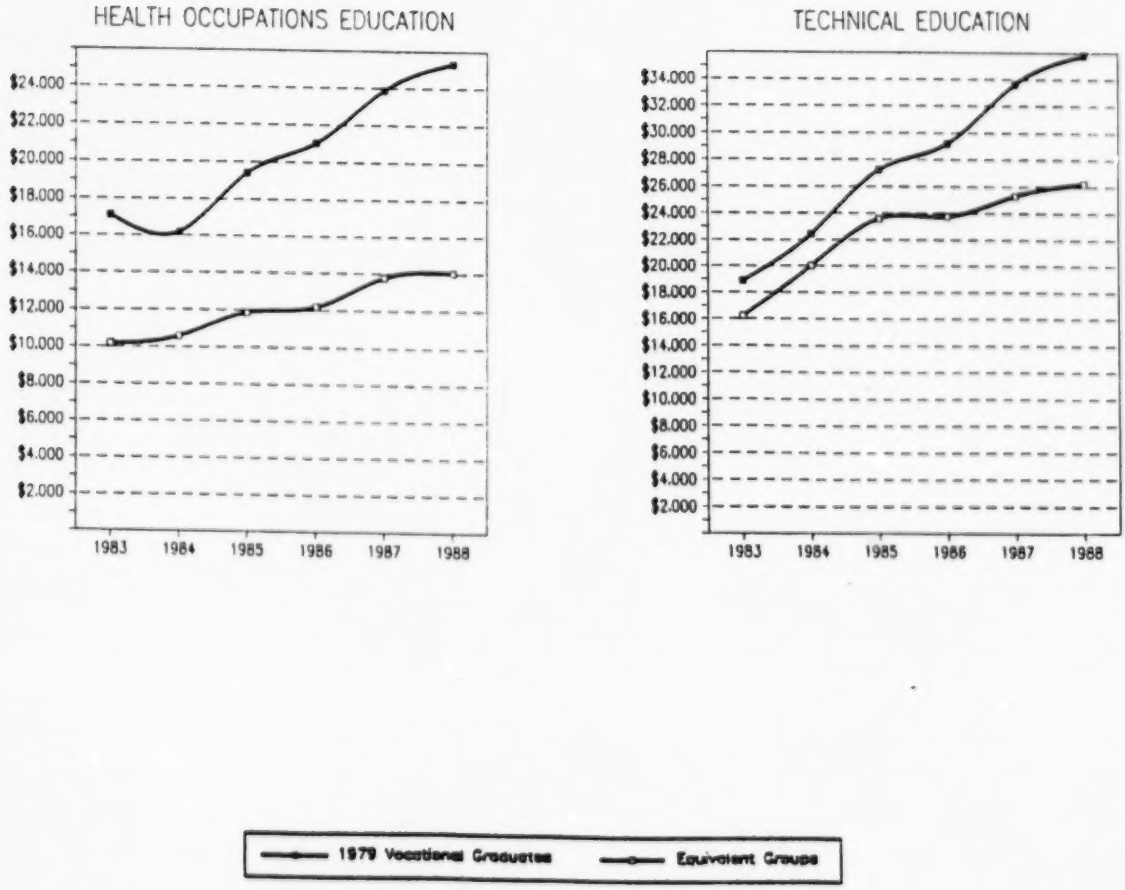
DIAGRAM IIIB-11

Longitudinal Curves
Mean Income in 1983, 1984, 1985, 1986, 1987 and 1988
1979 Associate Vocational Graduates vs. Equivalent Groups



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C. REGIONAL MOBILITY OF 1979 ASSOCIATE VOCATIONAL EDUCATION GRADUATES

The purpose of this section is to analyze the mobility patterns of vocational graduates by comparing their residence in 1988, 1987, 1986, 1985, 1984 and 1983 to that of 1979, the year in which they completed their programs.

Each vocational graduate was identified by the zip code of the school attended in 1979. Using the geographical regional classification of the State based on zip codes, we were able to determine for each vocational program the number of graduates who resided in each of the five regions of the State of Ohio (Central, Northeast, Northwest, Southwest and Balance of Ohio).

Regional Mobility, 1979-1988

The group data on vocational graduates provided by the Internal Revenue Service for 1987 were classified by the same geographical regions within the State as well as a sixth region, out-of-state, for each of the vocational programs. We were thus able to trace the mobility of the Associate Vocational graduates between 1983 and 1988.

For each of the vocational programs, the retention rate was calculated in each of the regions by comparing the region's percentage share in the total number of graduates in 1988 to that in 1979. To illustrate the calculation of the retention rate: if 10.00 percent of graduates of the program were trained in Northeast Ohio in 1979 while 9.09% of the same group were identified as residents of Northeast Ohio in 1988, then the region's 1979-1988 retention rate of graduates of the program is estimated to be 90.90% (9.09 divided by 10.00).

Table IIIC-1 provides the 1979-1988 retention rates by region for each of the two Associate Vocational programs studied as well as for both of these programs combined. The retention rate of both associate programs for the State is estimated at 74.18%, indicating that approximately 25.82% of the 1979 graduates were out-of-state residents in 1988. The State's retention rate was estimated to be in the 70.17% for Technical Education and 78.06% for Health Occupations Education.

TABLE IIIC-1

RETENTION RATES OF ASSOCIATE VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION (1979-1988)

VOCATIONAL PROGRAM	ALL OHIO	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
Health Occupations Education	78.06%	151.86%	90.90%			63.91%
Technical Education	70.17%			68.42%	191.95%	59.15%
All Programs	74.18%	151.86%	90.90%	68.42%	191.95%	61.53%

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A comparison of retention rates for the five Ohio regions shows one of the metropolitan parts of Ohio (the Southwest Ohio region) as experiencing the highest retention rate of 191.95%, i.e. in 1988 its share of residents among all 1979 Associate Vocational graduates was 191.95% of its share of graduates in 1979, an estimate indicating an increase of 91.95% in its share; while Central Ohio, Northeast Ohio, Northwest Ohio and Balance of Ohio have 151.86%, 90.90%, 68.42% and 61.53%, respectively. In each case, the share decrease (increase) reflects the net outmigration (inmigration) of graduates to other regions in Ohio as well as to out-of-state locations.

Regional Mobility, 1979-1983, 1979-1984, 1979-1985, 1979-1986, 1979-1987, 1979-1988

The mobility patterns of the 1979 Associate Vocational graduates can be analyzed by comparing their residence in 1983, 1984, 1985, 1986, 1987 and 1988 to that of 1979, the year in which they completed their programs.

The group data on vocational graduates provided by the Internal Revenue Service for 1983, 1984, 1985, 1986, 1987 and 1988 were classified by the same geographic regions within the State (as well as a sixth region: out-of-state) for each of the vocational programs. We were thus able to trace the mobility of vocational graduates between 1979 and each of the years 1983 through 1988.

For each of the vocational programs, a retention rate was calculated in each of the regions by comparing the percentage share in the total number of trainees in 1983, 1984, 1985, 1986, 1987 or 1988 to that in 1979.

Table IIIC-2 provides the retention rates of vocational graduates by region and vocational program for 1979-1983, 1979-1984, 1979-1985, 1979-1986, 1979-1987, and 1979-1988.

Retention rates are calculated on basis of residence. Therefore, retention by a region (or the State as a whole) included those who resided in the regions (or the State as a whole) but worked out of State and did not include out-of-region (or out-of-state) residents whose work place was in the region (or the State as a whole).

TABLE IIIC-2

RETENTION RATES OF 1979 ASSOCIATE VOCATIONAL GRADUATES BY VOCATIONAL PROGRAM AND REGION 1979-1983, 1979-1984, 1979-1985, 1979-1986, 1979-1987, 1979-1988

VOCATIONAL PROGRAMS	ALL REGIONS	CENTRAL OHIO	NORTHEAST OHIO	NORTHWEST OHIO	SOUTHWEST OHIO	BALANCE OF OHIO
All Programs						
1979-1983	78.90%	100.00%	94.33%	31.14%	100.00%	67.11%
1979-1984	75.91%	112.97%	81.28%	36.85%	127.83%	63.89%
1979-1985	74.65%	105.27%	87.16%	36.06%	141.87%	62.58%
1979-1986	74.80%	114.95%	84.60%	35.20%	135.22%	62.89%
1979-1987	74.81%	163.05%	84.79%	47.34%	188.36%	61.93%
1979-1988	74.18%	151.86%	90.90%	68.42%	191.95%	61.53%
Health Occupations Education						
1979-1983	83.33%	100.00%	94.33%			69.06%
1979-1984	79.80%	112.97%	81.28%			67.02%
1979-1985	78.63%	105.27%	87.16%			64.81%
1979-1986	79.17%	114.95%	84.60%			65.43%
1979-1987	78.64%	163.05%	84.79%			64.50%
1979-1988	78.06%	151.86%	90.90%			63.91%
Technical Education						
1979-1983	75.63%			31.14%	100.00%	65.43%
1979-1984	71.97%			36.85%	127.83%	60.80%
1979-1985	71.96%			36.06%	141.87%	60.80%
1979-1986	71.87%			35.20%	135.22%	60.91%
1979-1987	70.85%			47.34%	188.36%	60.08%
1979-1988	70.17%			68.42%	191.95%	59.15%

1979 Vocational Education Graduates in 1988: A Longitudinal Study Based on Federal Income Tax Data by I.A. Ghazalah, Ohio University

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The economic performance of graduates of vocational programs is a primary factor in the evaluation of vocational education. In its measurement of the economic performance of graduates of vocational programs, this study uses an original source of information – federal income tax records. The federal income tax source avoids a number of limitations associated with follow-up studies utilizing questionnaires. The tax records data are standardized by type of income and by period (tax year), and do not rely on the memory nor the selectivity of individual responses to questionnaires. The data were provided in batch form by the Internal Revenue Service from its Information Returns Master File in full compliance with the strict requirements regarding disclosure of personal information.

This study examines the performance over time of a random sample of 15,055 graduates in 1979 of the same twelve Secondary and two Associate Vocational programs. This is the sixth year of this longitudinal study where the performance in 1988 of the same group was analyzed and compared to that measured in 1987, 1986, 1985, 1984 and 1983.

The data on the 1979 graduates of the twelve Secondary and two Associate Vocational programs are categorized by the area of residence in 1988 – any of the five regions in Ohio (Central, Northeast, Northwest, Southwest and Balance of Ohio) and outside Ohio. The income of completers of vocational programs is compared to income of equivalent groups in the general population (same years of schooling, age and region of residence). The study also investigated the geographic mobility of vocational graduates since 1979, their year of vocational program completion.

For each of the vocational programs, a retention rate was calculated for the State of Ohio as a whole, and for each of the regions within the State. This was done by comparing the percentage share of the program graduates in residence during the year of study to that during 1979, the year of graduation. For all of the Secondary Vocational programs, the state retention rate was 84.57% in 1983, 82.21%, 82.45%, 82.75%, 82.20%, and 82.56% in 1984, 1985, 1986, 1987, and 1988, respectively, indicating that more than 82% of the graduates continued to reside in the State.

For the Associate Vocational programs, the equivalent retention rates were 78.90% in 1983, 75.91%, 74.65%, 74.80%, 74.81% and 74.18% in 1984, 1985, 1986, 1987 and 1988, respectively. For the individual programs, Secondary Vocational programs had a range of retention rates of 83.33% to 90.08% in 1983, and 80.46% to 84.72%, 80.28% to 85.06%, 80.51% to 85.47%, 79.44% to 86.52%, and 80.13% to 86.05% in 1984, 1985, 1986, 1987 and 1988, respectively. For the Associate Vocational programs, the state retention rates in 1983, 1984, 1985, 1986, 1987 and 1988 were 83.33%, 79.80%, 78.63%, 79.17%, 78.64%, and 78.06% for Health Occupations Education and 75.63%, 71.97%, 71.96%, 71.87%, 70.85% and 70.17% for Technical Education.

These calculations indicate that the retention rates for the Secondary Vocational programs were highest in 1983, followed by 1986 and 1985 and lowest in 1987. For the Associate Vocational programs, the retention rates were highest in 1983, followed by 1984 and 1986 and lowest in 1988. In all cases, the retention rates remained high.

The income performance of the 1979 graduates was traced over six successive years: 1983, 1984, 1985, 1986, 1987 and 1988. The incomes of the 13,109 Secondary Vocational graduates and of the 1,946 Associate Vocational graduates are compared to incomes of equivalent groups in the general population (same age, years of schooling and region of residence). The results indicate predominately higher incomes for graduates of all Secondary and Associate Vocational programs in the study. In 1988, the mean incomes of the Secondary Vocational graduates are higher by 9% to 88% and those of the Associate Vocational graduates by 37% and 80%. The highest percentage income also varies by region of residence in 1988.

The most significant finding for the 1979 longitudinal study group was the general widening of the margin in 1988 compared to 1987 between their incomes and the incomes of the comparable group (same age, years of schooling and region of residence) in the general population.

In 1988, the Secondary Vocational graduates' ratios of their mean income to mean income of comparable groups ranged from 1.09 to 1.88 compared to a range of 1.08 to 1.77 in 1987, 1.20 to 1.90 in 1986, 1.16 to 1.87 in 1985, 1.27 to 1.82 in 1984, and 1.07 to 1.67 in 1983. In eleven out of the twelve programs, the ratios were higher in 1987 than in 1983. But in all of the twelve programs, the ratios in 1988, 1986, 1985 and 1984 were higher than in 1983.

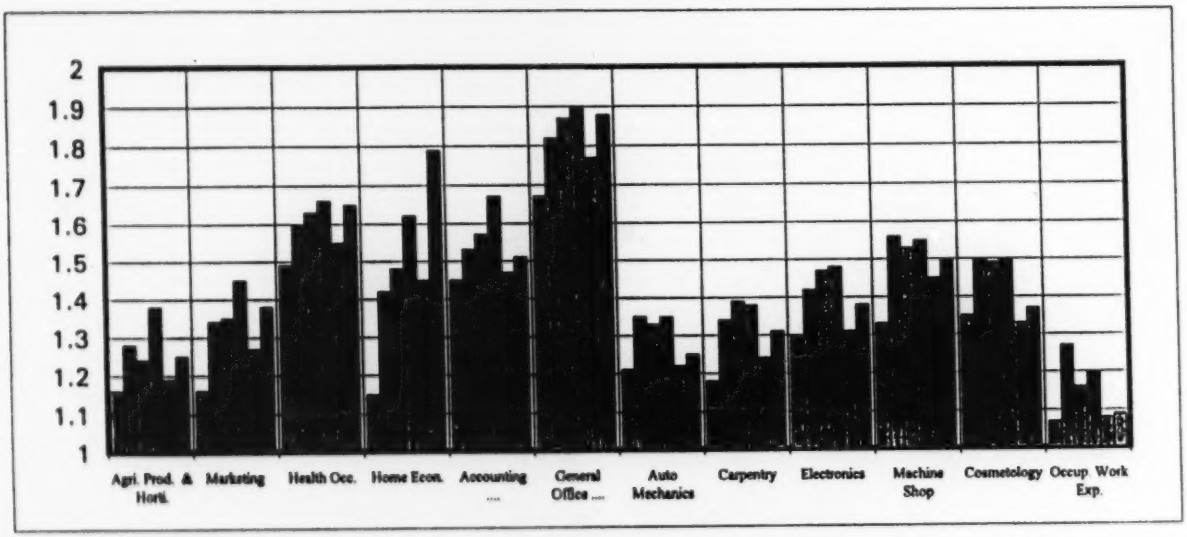
For the 1979 graduates of the two Associate Vocational programs, the ratios in 1988 of their mean income to mean income of comparable groups were 1.80 for Health Occupations Education and 1.37 for Technical Education. In both cases, the ratios were higher than the 1987, 1986, 1985, 1984 and 1983 ratios of 1.73 and 1.33, 1.73 and 1.23, 1.64 and 1.15, 1.53 and 1.12, and 1.68 and 1.16, respectively.

The following table and diagrams present these ratios for the 1979 Secondary and Associate Vocational graduates by vocational program for 1988, 1987, 1986, 1985, 1984 and 1983.

Ratios of Mean Income of 1979 Vocational Graduates to Mean Income of Equivalent Group in the General Population (1983-1988)

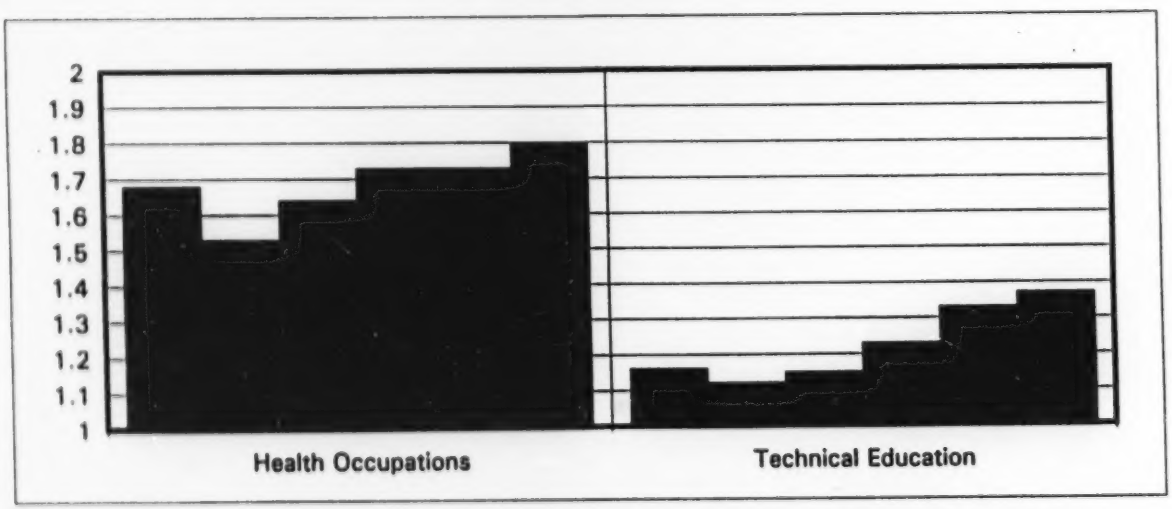
	1983	1984	1985	1986	1987	1988
Secondary Programs						
Agricultural Production and Horticulture	1.16	1.28	1.24	1.38	1.19	1.25
Marketing	1.16	1.34	1.35	1.45	1.27	1.38
Health Occupations Education	1.49	1.60	1.63	1.66	1.55	1.65
Home Economics Education	1.15	1.42	1.48	1.62	1.45	1.79
Accounting, Computing and Business Data Processing	1.45	1.53	1.57	1.67	1.47	1.51
General Office Clerical, Stenographic, Secretarial and Related Occupations	1.67	1.82	1.87	1.90	1.77	1.88
Auto Mechanics	1.21	1.35	1.33	1.35	1.22	1.25
Carpentry	1.18	1.34	1.39	1.38	1.24	1.31
Electronics	1.30	1.42	1.47	1.48	1.31	1.38
Machine Shop	1.33	1.56	1.53	1.55	1.45	1.50
Cosmetology	1.35	1.50	1.49	1.50	1.33	1.37
Occupational Work Experience	1.07	1.27	1.16	1.20	1.08	1.09
Associate Programs						
Health Occupations Education	1.68	1.53	1.64	1.73	1.73	1.80
Technical Education	1.16	1.12	1.15	1.23	1.33	1.37

Ratios of Mean Secondary Vocational Graduate Income
to Mean General Income
1983-1988



Bars for each Vocational Program show ratios for 1983, 1984, 1985, 1986, 1987, and 1988.

Ratios of Mean Associate Vocational Graduate Income
to Mean General Income
1983-1988



Bars for each Vocational Program show ratios for 1983, 1984, 1985, 1986, 1987, and 1988.

The data and analysis of the data presented here show the value of utilizing federal income tax records as a source of information on the performance of graduates of vocational education programs. The rewards from obtaining reliable and consistent federal tax data point to the potential in the pursuit of information on the performance of vocational graduates.

Knowledge of the performance of vocational graduates as a whole as well as graduates of specific programs would contribute to effective decision-making. Longitudinal studies of groups of vocational graduates would provide information on the nature and level of impact of vocational education and the change over time in this impact.

The study of six successive years of the 1979 graduates has shown a continuing margin of the incomes of vocational graduates relative to the equivalent group in the general population. As the longitudinal study follows up the same group in successive years, a reconsideration of conventional assumptions about the duration of vocational education benefits may be in order.